

CHAPTER IX.

CONCERNING EWES.

Q. **W**HAT precautions should be taken in coupling sheep?

A. A good choice of rams and ewes should be made to improve the breed, or to prevent it from degenerating. It is, above all, necessary to select such animals, as are in good health, and of a proper age. If the ewe should be found to refuse the ram, some handfuls of oats or hemp seed should be given them; or a couple of handfuls of bran, mixed with a half an ounce of salt, and an onion (1); or two cloves of garlic (2), cut into small pieces, mixed with two handfuls of bran, and half an ounce or two pinches of salt. The rams should have the same provender given them, when they are not sufficiently ardent.

Q. What care should be taken of the ewes after coupling?

A. It is necessary to keep them from every thing, which might kill the lamb before its birth, or make them miscarry. Bad food, fatigue, jumping, compression of the belly; too great heat, or fright, may cause these accidents, which are but too frequent.

Q. How can the accidents, which cause miscarriage, be prevented?

A. The fear, which a clap of thunder, or the approach of a wolf excites, cannot be prevented; but

(1) *Allium cepa*, L.

(2) *Allium sativum*, L.

dogs, rams, or other animals, may be hindered from frightening the ewes; which should be well fed, driven gently, and not put in a situation to jump across ditches, rocks, hedges, &c. or to crowd one on another, or to strike against gates, walls, stones, or trees.

Q. How long a time do ewes go before lambing?

A. About one hundred and fifty days, or nearly five months.

Q. How is it known, when a ewe is about casting her lamb?

A. It is known by the bag filling with milk, and by the swelling of the the natural parts; and the discharge of serum, and slimy matter therefrom, to which the French shepherds give a particular name, (*les mouillures.*)

Q. How long do these discharges continue before the ewes bring forth?

A. Twenty-five days, and sometimes more than a month.

Q. What is to be done, when a ewe suffers a long time without being able to bring forth?

A. It should be first ascertained, if she wants strength, or is too much heated or agitated: in the last case, it is proper to bleed her; but if she is too weak, 't is proper to give her a couple of glasses of tart wine, or drink, or beer, cider, or perry; the cheapest of these beverages, in the place where the flock is, should be preferred. The provender may be given, which has been before recommended, to excite heat at the time of coupling. But before using these remedies, you must be sure that the birth is de-

laid only through the weakness of the dam: the remedies would be very contradictory, if the ewe, instead of being too weak, should be too much inflamed.

Q. By what signs is it known, when a ewe is too much heated and inflamed?

A. By the ears being warm, and the pulse quicker than in the other ewes, by the tongue, dry lips, and beating of the flanks, &c. &c.

Q. What is proper to be done, when the ewe is lambing?

A. Nothing, if the lamb is properly presented and comes forth readily; but if it remains too long in the passage, it is proper to assist its coming, by drawing it gently, and by degrees. The ewe should be assisted only when she makes an effort to discharge her burden.

Q. What is to be done when the lamb is not properly presented?

A. Attempts should be made to change its position, and to put it back, in order to place it in a situation to be brought forth.

Q. What should be the position of the lamb in the belly of the mother, near her term, that it should be readily brought forth?

A. It should present the end of the muzzle at the orifice of the matrix, or womb, and should have the two fore feet underneath the muzzle, and a little before it; the two hind legs bent under the belly, and extending behind, in proportion as it comes forth from the matrix.

Q. What are the bad positions, which commonly prevent lambs from being discharged from the matrix ?

A. 1st. The bad position of the head, which in the lamb, instead of presenting the end of the muzzle to the orifice of the matrix, presents some part of the top or sides of the head, whilst the end of the muzzle is turned aside or behind:

2d. The bad position of the fore legs, which instead of being extended before in a manner, that the feet should be found at the orifice of the matrix, with the muzzle, are bent under the neck, or are extended behind.

3d. The bad position of the ombilical or navel cord, when it passes before one of the legs.

Q. What ought the shepherd to do, in order to change these bad positions ?

A. Whenever he perceives at the orifice of the matrix any other part of the head than the muzzle, he should endeavour to push back the head, and draw the muzzle to the opening of the matrix. The shepherd should oil his fingers, to perform this operation, without injuring the ewe or lamb. If he should not observe the feet preceding, he should find them, and draw them to the orifice of the matrix : if the fore legs are stretched behind, he should endeavour to bring out the head, and afterwards attempt to draw out the two fore legs together, or one after the other, to prevent the shoulders from being too great an obstacle to the discharge of the lamb. If the fore legs should remain stretched behind, it will be necessary to draw

the lamb with so much force, as to bring out his shoulders, even at the risk of killing him : should he observe the navel string to be before one of the legs, he should endeavour to break it, without stopping the delivery ; the string breaks of itself, as soon as the lamb is brought forth.

Q. What is the after birth ?

A. The after birth is composed of membranes, which enveloped the lamb in the belly of the mother ; it is thrown out sometimes after the lamb is born : if it does not come away of itself, the shepherd should endeavour to draw it away gently ; if it be done by force, there is danger of breaking it, or tearing the matrix, or pulling it out with the after birth. When the after birth is discharged, it should be detached from the ewe, lest she should eat it.

Q. What is proper to be done for a ewe after lambing ?

A. Some hours after the ewe has lambed, it is proper to give her a little warm water, with bran, barley or oats, and the best food, which the season affords, and she should be left for some days with her lamb ; while she nurses, she should be well fed.

Q. What ought to be done, that the ewe should nurse and take care of her lamb ?

A. The teat of the mother, that is, their ends, should be pressed for the purpose of opening them to give passage for the flow of the milk : it is proper to observe, if the ewe licks the lamb ; and if she does not, a little powdered salt should be scattered over the lamb, to induce her to lick it : when the weather

is moist and cold, the mother should be assisted, if necessary, in drying her lamb, by wiping it with hay or linen. Ewes with their first lambs are more liable than others, to neglect them. To make them more attentive, they should be separated from the flock, and shut up alone with their lambs. When a lamb does not of himself search for the teat to suck, he should be forced to it, and some of the milk should be drawn from the teat into his mouth. When a ewe repels her lamb, and hinders it from sucking, or avoids it, she should be held, and one of her hind legs raised, so as to place the teats within reach of the lamb.

Q. How many lambs will a ewe produce at a birth?

A. Commonly one, sometimes two, and very rarely, three; there is a breed of sheep, which year twice in the year. It is said, that the ewes of Juliers and Cleves produce twice a year, and have two or three lambs at a birth; and that five ewes would produce twenty-five lambs in a year.

Q. What is proper to be done, when a ewe makes more of one lamb, than another of the same litter?

A. If the mother is fat, and the teats are well filled, if the season begins to be good for pasturing, two lambs may be left with her, but the third should be taken away; the second should also, if the ewe is feeble, or has but little milk, or the season is unfavourable.

Q. How can the ewes, which have not milk enough, be made to give more?

A. By giving them oats or barley, mixed with bran, radishes, turnips, carrots, parsnips, salsifis, (goat's beard) boiled peas, beans, cabbages, or ground ivy, (*gechoma hederacca*, L.) and by driving them to better pastures: it is remarked, that the change of pasture gives them appetite, and does them much good, provided they are not taken from a good to an inferior one.

Q. At what time can ewes be milked?

A. When the lamb, which the ewe should nurse, cannot suck, the milk is drawn from the teat for the lamb to drink it: the ewes may be milked, when the lambs are dead or weaned. There are German shepherds, who wean the lambs at six weeks or two months, and afterwards milk the ewe for the whole year; as soon as the lambs can feed, there are people who separate them from their mothers, without weaning them, altogether. In the morning, after having milked the ewes, they allow the lambs to suck the little milk, which remains in the teats: afterwards they remove the lambs for the whole day:—in the evening, they do the same; and it is said, that the little milk, which remains at each time, with the herbage of the pastures, will afford sufficient food for the lambs; but if the grass be not very nourishing, this custom may be hurtful to the lambs.

Q. What happens to the ewes, when they are milked or suckled for too long a time?

A. The drawing off of the milk preserves them from many diseases, which might arise from superabundant humours: but when it continues for too

long a time, the ewes grow thin, fall away, and their wool is reduced in quantity.

Q. What ewes can be milked with advantage?

A. There is no risk in milking ewes, whose wool is of a bad quality and little value; but it is improper to milk such as have good wool, or are principally depended on, for the rearing and maintaining the breed. However, if they are to be suspected of diseases arising from superfluous humours, they may be milked once or twice a week to carry them off: it is thought, that this precaution preserves them from pulmonic diseases, the rot, &c. but it would be proper to throw away the milk, as it is unhealthy.

Q What is done with the ewe's milk?

A. It may be used like cow's milk: it affords less whey; is richer and more agreeable to the taste: it has more of the parts proper for making cheese, which, if well made from it, is excellent, and in great demand: and this is principally the case with the cheese of Roquefort, in the department of Aveyron.

CHAPTER X.

CONCERNING LAMBS.

Q. **W**HAT is proper to be done, when a lamb is just dropt?

A. It is necessary, to examine the bag of the mother, to cut away the wool, if there is any on it, to know, if she has milk enough, and to squeeze it from the teats, to see if it be good. It should afterwards

be observed if the ewe licks her lamb, and the lamb of himself sucks.

Q. How is it known if the milk be good?

A. The milk may be supposed good, if the ewe is in good health, and it is white and of a good consistence, that is, thick enough. But when it is glutinous, blue, yellow or clear, it is bad.

Q. What ought to be done if the ewe has no milk, or not enough, or the milk appears bad, or the ewe is sick, or dies in lambing?

A. The lamb should be given to another ewe, which may have lost its lamb, or to a goat, which has milk?

Q. What is to be done, when a ewe will not suckle a lamb, which did not come from her?

A. The ewe, it is said, may be deceived, by covering the lamb for a night, with the skin of that, which she lost, if the skin is fresh;—although it had been taken off in the morning, the ewe is made to believe she has recovered her own lamb. But there is a more ready method, which is only to rub the body of the dead lamb against the one, it is intended to be nursed in its place.

Q. What ought to be done, when there is neither a ewe nor a goat to suckle a lamb, which has lost its mother?

A. A lamb is made to drink warm ewe's, goat's, or cow's milk, at first, by the spoon, and afterwards by the tippler, the snout of which is covered with linen, for the purpose of making the lamb suck as though it was the teat of a ewe. The tippler should be given as often as he would have sucked. The lamb

must be kept in a place, as warm as it would have had, when lying by the side of its dam. There are lambs which, at the end of three days, have dispensed with the tippler, and drank out of a bowl: at first, the milk is given four times, then three, and at length twice in a day, until they are strong enough to eat grass.

Q. If there is no milk, or it cannot be spared, can another drink be substituted?

A. Warm water, with barley flour mixed in it, may be given, but it is less nourishing than milk.

Q. What care should be taken in making a lamb drink through a tippler?

A. It is proper to be cautious that the mouth should not be too high, because in this position, the milk may suffocate the lamb by entering the lungs through the wind pipe.

Q. What must be done, when a lamb looks dejected, weak or thin?

A. The shepherd should observe, if the dam is in good health, the milk good, and the lamb sucks; or whether there is another lamb which steals his milk. There are ravenous lambs, which suck many ewes, one after the other, while the lambs of such ewes want food. It should be carefully observed, that all the lambs, principally the weakest, suck their own dams, have good milk, and in sufficient quantity; the greater part of the lambs which are lost, die of hunger, or from bad milk.

Q. What proof is there that a great number of lambs die with hunger?

A. Of forty-three lambs, which were opened at

Montbard, before the month of April, in 1767, twenty-one died with hunger; for no food or substance could be found in the stomach or guts.

Q. After hunger and bad milk, what further is to be apprehended for the lambs?

A. The wool that they may swallow forms in the rennet bag, *balls*, called by the French shepherds, *gobbes*; but it often happens, that these gobbes or balls close the entrance of the guts, prevent the passage of the food, and kill the lambs. When the dug of the ewe is covered with wool, the lamb is apt to seize it instead of the teat, to pull it off and swallow it; on this account, the shepherd should examine the dugs of the ewes, and cut off the wool, which may be found on them: when the lambs eat at the rack, some of the finer parts of the hay fall on their bodies, and attach to, and remain on the wool; the lambs seeing these bits of hay upon their mothers, and on the other lambs, in their desire to eat them, are apt to draw out and swallow filaments of wool, from which, these balls are formed. The racks should be placed very low, so as to prevent the fragments of hay from falling upon the lambs; and if the shepherd should see any of them on the wool, or on that of the ewes, he should take them off. The manner of knowing and relieving sheep, when thus oppressed, will be hereafter explained.

Q. What ought to be done with lambs benumbed with cold?

A. When a lamb has suffered a great deal from cold, it should be warmed and covered with warm linen, and laid before a gentle fire, in such a manner

that his head may be shaded by his body. In England they put lambs stiffened with cold into stacks of hay, or into an oven heated with straw only : lambs have been thereby saved, which have suffered so much from the cold, as to have scarcely the appearance of life. The lamb is made to take a spoonful of warm milk, or if necessary, a spoonful of beer, or of wine and water. It is fed by the fire side for some days, and if it continues feeble, is put with its mother into a covered or close place, until recovered.

Q. What is proper to be done with lambs, which do not come till the end of April or in May ?

A. They are not kept in the flock, because they are feeble and small, but are fatted for eating. It is easy to fat them, because they come at a season when there is a great deal of feed : these are the first lambs from young ewes, and the last from the old ones. In France they have the name of tardons, or late comers ; and in England, cuckolds, because they come in the season, in which this bird sings.

Q. How are lambs fatted ?

A. They are kept in the fold, where they suck their dams night and morning, and during the night. In the day time, while their dams are in the field, they allow them to suck the ewes, which have lost their lambs, and fresh litter is given them once or twice every twenty-four hours. A large lump of chalk is placed for them to lick : the chalk prevents them from scouring, to which they are liable, and which hinders them from fattening. When the male lambs, which are for fattening, are fifteen days old, they should be cut or castrated,

for reasons to be given hereafter, when treating of wethers : male lambs cut, have their flesh as good as female lambs, but they do not attain the size of those, which have not been cut : most people, who fat lambs for sale, do not like to cut them, until they are large ; and although their flesh has not so good a flavour, they sell better.

Q. At what age can lambs take other food than milk ?

A. There are lambs, which begin to eat at the troughs and in the rack, and to feed on grass when eighteen days old ; then the following things may be given them in their troughs.

Oat-meal alone, or mixed with bran ; it is said, that bran gives them too much belly, if it is not mixed with other food.

Peas ; the blue coloured are more tender and nourishing than the white or grey : if they are cracked in boiling water, and mixed with milk, they are the more tender and relishing ; they may be also mixed with oat-meal or barley flour, but barley flour alone disgusts them, from its sticking to their teeth.

Oats or barley in grain, (or passed two or three turns in a mill) is the food, that lambs like the best ; it is also the most healthy, and that which fats them the most readily.

Hay, such as is the finest ; that is, not coarse hay.

Straw, twice thrashed to make it softer.

Dry trefoil, oat chaff, &c. and particularly saintfoin.

The grasses of low grounds, and all such as are good for fattening wethers, as will be shewn in the next chapter.

Q. At what age are lambs fit for eating?

A. They are eaten at three weeks or rather a month, at six weeks, and at the latest, two months old.

Q. What precautions do lambs require before they are weaned?

A. Such as have been kept under cover on account of severe cold should not be kept too warm: air should be given them, and they should be made to go out as often as possible, to strengthen them. When a lamb is eight days old, he can follow his mother near the fold: when the lambs are sick, they should be treated according to their age and diseases.

Q. When should lambs be weaned?

A. At such time as the milk of the mother begins to dry: the lamb is then about two months old. It is in the month of May for the lambs which come in February, or in the beginning of March: if they come sooner, they should be allowed to suck longer, in order that they should have good feed, when weaned. For example, when a lamb comes in December, he cannot have good grass in February, in countries where the winter is severe; it is therefore necessary to wait until the month of March or April to wean him. There are people, who do not wean their lambs, until shearing: some do not know their mothers after shearing their fleeces; it happens oftener, that the mother does not know its lamb, but with difficulty, after it has been shorn: if the lamb remains with the ewe, she weans it herself, when her milk fails or she is disposed to take ram, when she discards and drives it from her; sometimes the lambs dislike sucking, when there is good pasture.

Q. How are lambs weaned ?

A. They are separated from their dams, and if possible, at such a distance as not to be within hearing of each other's bleating; and that they may the more readily forget each other, an old ewe should be turned out with about forty lambs to guide and keep them together: they are put into pastures of trefoil, mellilot,^{*} or rye grass, &c. or into common pastures, if they are not moist. There is a method of weaning lambs without separating them from the ewes, by a sort of a muzzle, which is put on them, loose enough to allow them to feed; it is armed with points, or thorns, to prick the dugs of the ewe, which is thereby obliged to repel her lamb, when it attempts suckling; but these points should not be sharp enough to wound the bag of the ewe.

Q. Is it proper to cut off the tail of the lambs ?

A. It is said, that the tail of the lamb should be so shortened, as only to prevent it from loading with mud at the end, lest when collected and hardened, it should wound the legs of the animal, or excite it to run: when a sheep, having a ball of dry earth attached to the end of the tail, begins to quicken his pace, it strikes more and more upon the lower part of the legs; these strokes, being redoubled, excite the sheep to that degree, that it is difficult to stop him: the end of the tail of the lambs should be cut, in a country where the mud is of a nature to stick thereto and become hard.

* *Trifolium melilotus officinalis*, L.

Q. How ought the tail of the lamb to be cut ?

A. This operation should be performed in mild weather, when the lamb is a month or two old, or in the autumn after his birth : the tail is cut at the joint between two bones : wood ashes should be put upon the wound ; if the ashes should not answer, mix some tallow with them.

Q. Is it proper to cut the wool from the tail ?

A. The wool should be cut from the tail and even from the buttocks, when loaded with dung, which will produce itching and the scab.



CHAPTER XI.

CONCERNING WETHERS.

Q. **W**HY do they make wethers ?

A. It is done to render the flesh more tender, and to take from it a bad flavour, which it would have, if the ram was left in his natural state ; to dispose him to take more fat ; to make the wool finer and more abundant, and at the same time, the animal more gentle and manageable.

Q. How are wethers made ?

A. By castration ; lambs castrated are called wethers at a year old.

Q. At what age should lambs be castrated ?

A. In a week or fortnight after their birth : it is also customary to castrate them at three weeks, or at five or six months ; but their flesh is never so good, as when they are castrated at eight days old : the longer

the operation is delayed, the more likely it is to destroy the lamb. Those which are castrated have not the head so beautiful, nor do they become so large as the others.

Q. In what manner should they be castrated ?

A. When the lamb is castrated in eight or ten days, the most simple method is, to make an opening by an incision at the bottom of the bag, and to force the testicles through the opening, and to cut off the cords above the testicles : this is what is called lamb castrating. When the lambs are older, incisions are made on each side of the bag, and the testicles forced through the two incisions, and the cord cut above each testicle : this operation is called calf cutting, because calves are castrated in the same manner.*

Q. What precautions should be taken before and after these operations ?

A. It is necessary to choose a season, when it is

* There is still another method of castrating before killing them, which is more simple, and quicker done :—a single opening is made at the bottom of the bag, and one testicle is first forced through this opening, which the shepherd seizes with his teeth and draws out, whilst with both hands he sustains the bag; the second testicle is then forced through the same opening, and taken out in the same manner. Some persons, after forcing out the testicle, gently twist the cord, and then take it out more easily by hand; less risk is run in this way of making an inward rupture: the opening is shut by gently pressing together the edges of the wound with the fingers, without putting any kind of grease to it, and the cicatrix readily forms. All these methods of castrating succeed equally well, and it is rare that accidents happen. There is a contraction in the jaws sometimes observed; the shepherd, to remove or prevent it, when the lamb is put on his feet, after the operation, passes his finger into his mouth to make him chew a little...*Newsard.*

neither too hot nor too cold: great heat may make the wound mortify; too great cold might hinder it from healing. After the operation, the bag is to be rubbed with hogs' lard; the lambs should be kept still for two or three days, and be better fed than usual.

Q. Is there no other method of making wethers?

A. There are two others; one is to tie the bag above the testicles tight with a piece of twine. The ligature is continued for eight days, when the bag is cut off below it. This operation is performed only, when the animal is eighteen months or two years old. The other method is by grasping the bag above the testicles and twisting it: the testicles are afterwards forced up into the belly, and a ligature is made above the bag to prevent the testicles from again descending, and is thus left for several days: this operation is performed on rams, three months before killing them.

Q. What are castrated ewes?

A. Castrated ewes are ewes from which the ovary has been taken, at an early age, to prevent them from breeding: on account of this kind of castration, they are called brebis chartrices, castrated ewes: but it is better, says our author, to call them female wethers, because they are in the state of common wethers.

Q. For what purpose, do they castrate ewes?

A. To make them as useful as wethers, in the wool they produce, and in the quality of the flesh.

Q. At what age are they so made?

A. They wait until the ewe lambs are six weeks

old, because it is necessary, that the ovary should be as large as haricot beans, so as to be easily felt with the finger.

Q. How is the operation performed ?

A. The shepherd performs it by laying the lamb on the right side, near the edge of a table, for the purpose of having the head hanging from it : he places on his left an assistant, who draws out the left hind leg of the lamb, grasping it with the left hand at the fet-lock, above the hoofs, to keep in place ; a second assistant, placed upon the right of the operator, takes the fore legs and right hind one, and grasps them all three in his right-hand at the fet-lock. The lamb being thus prepared, the operator raises the skin on the left flank, with the two first fingers of the left hand, to form a fold at an equal distance between the highest part of the bone of the haunch, and the navel : the assistant on the left side lengthens this fold, with the left hand also, quite to the place of the false rib ; then the operator cuts the fold with a very sharp knife, so that the incision should be only an inch and an half long, on a line from the highest part of the haunch bone to the navel. The opening being made, by cutting by degrees through the whole thickness of the flesh, quite to the place of the guts, without touching them, the operator introduces his fore finger, that is, that which is next to the thumb, into the belly of the lamb, in search of the left ovary : as soon as he feels it, he gently draws it out through the opening : the two large ligaments, the womb, the matrix, and the other ovary come out at the same

time: the operator cuts off the two ovaries, and puts back the ligaments and matrix; he then makes a seam of three stitches, at the opening, to close it; he passes the needle through the skin only, without its entering the flesh, and leaves on the outside the two ends of the thread, and puts a little grease upon the wound. After ten or twelve days, when the skin is cicatrised, the thread is cut at the middle stitch, and the two ends drawn out to prevent suppuration: when this operation is well done, the lambs feel it only the first day; their legs are a little stiff, and they do not suck; but on the second day they will appear as usual.

Q. What soil agrees best with wethers?

A. In general, high and dry soils agree better with sheep than low and moist ones, principally for rams and wethers for keeping; that is, for wethers not intended for fattening. But moist pastures contribute to fatten wethers, ewes, and lambs, and the corded rams designed for the butcher.

Q. In what soil should sheep of different ages be put?

A. Wethers three or four years old are profitable only in soils having a great deal of feed; but wethers one or two years old may be profitable in soils, where the pastures are not so rich.

Q. When young wethers have been put into thin pastures, what is to be done with them when older?

A. They should be sold to people, who have better pastures, who will again sell them to others having such as are still better. In this way each draws the

full profit from his pasture, by purchasing every year, wethers of an age best suited to the quality of the soil, for which he intends them. The produce of the fleece is obtained, together with the profit, which is made by selling them higher at the end of the year, than their first cost, on account of the growth they have obtained in the time.

Q. When are wethers found to be fat in a flock ?

A. In examining the flocks in autumn, there are often found fat wethers, without having taken measures to fat them. Although they may not have as much tallow as those, which have been forced by food, they are to be preferred, their tallow being firmer, and their flesh more healthy : it is good health that makes them fatter than the rest of the flock. If they are not killed, they will lose their flesh in winter, and recover it the year following. It is not like the fat of sheep forced by food, which is a disease of which the animal will die, if not timely sent to the butcher.

Q. What is proper to be done to fat wethers ?

A. There are three methods of fattening them : one is, by pasturing them in good feed ; this is called grass fattening : the second is to give them good food at the rack and in the troughs, which is called dry fattening, from the fodder by which it is produced : the third, is to put the wethers to herbage in autumn, and afterwards to stall feeding, (*à l'engrais de pouture.*)

Q. How much time is required to fat wethers by grass ?

A. That depends upon the quantity and quality of the grasses : when they are good, wethers may be

fatted in two or three months, and of course three fattings may be made in a year; in beginning as early as March, when the pastures are not so good, it requires a longer time.

Q. What care do wethers require, when put to fat on grass?

A. It is proper to keep them as quiet as possible; to drive them very gently, and to observe not to heat them, but to make them drink as much as possible, taking care that they do not scour, which is commonly produced by dew.

Q. How do they manage wethers to fat them on grass?

A. This fattening is made only in the spring, summer and autumn, in countries where the frost destroys the grass: the wethers are driven to pasture very early in the morning, before the sun has dried the feed; they are then put into cool and shady places during the heat of the day, and made to drink; they are again driven to moist pastures in the evening, and there left till it is quite night.

Q. What are the best grasses for the fattening of wethers?

A. Lucern is the most nutritious grass, and fats them the soonest; but it is said, the fat becomes yellow, and has a disagreeable taste; it is apt to inflate them, and may cause their death. The trefoils are almost as nutritious and dangerous as lucern; it is pretended, they give mutton a yellow colour, but a good flavour. Saintfoin is good for fattening, and nothing injurious is to be apprehended from it.

Q. What other grasses are there for the fattening of mutton?

A. The fromental (quitch grass, sheep fescue grass, or bird grass,) herds grass,* ray grass, and pasture grasses, particularly those of low moist meadows, and in some countries stubble after harvest: herbage generally of the woods makes good pasture for sheep, but does not fat them so fast, as lucern, trefoil, and saintfoin.

Q. What is the method of stall feeding, l'engrais de poutoure?

A. This method of fattening is done in the cold season of the year, that is, in December: after having shorn the wethers, they are shut up in a stable and allowed to go out only at noon, while they are putting fodder into their troughs; in the morning and evening, and in long nights, they are fed at the rack.

Q. What food is given to sheep, while stall feeding?

A. Good fodder, grain, and other very nourishing things are given them, according to the produce of the country, and its price; but care should be taken, that the expense of fattening shall not exceed the gain to be derived from selling them, when fat. In many places they give to three or four years old wethers each three fourths of a pound of hay, morning and evening, and at noon a pound of oats and a pound of bread, or oil cakes, made from rape, or hemp seed broken to the size of hazel nuts, and water them every day. In other places, each wether has given to him every morning ten ounces of hay, a quarter of a pound of oats, and oil cakes as above; and in the eve-

* Phleum Pratense

ning ten ounces of hay ; but the best method is to give them as much as they can eat of this food. The bread or oil cakes make the flesh oily, and gives too much tallow ; it is necessary to substitute for the oil cake, some other food for the last fifteen days, in order to give the flesh a good flavour.

Q. What is the best food for stall feeding sheep ?

A. The different kinds of grain, such as oats, or coarsely ground barley, or barley flour, peas, beans, &c. the food, which fattens the most, is oats mixed with barley flour, or bran, or both together. If bran is mixed alone with barley flour, it will stick to the teeth, and the wethers are disgusted with it.

Q. Is there other food for the fattening of wethers ?

A. They may be fattened with turnips or cabbages.

Q. How are sheep fattened with turnips ?

A. They begin by pasturing the wethers upon the stubble, after harvest, until the month of October, to dispose them to fattening ; afterwards they are put into a field of turnips in the day, and in the evening oats with bran and barley meal are given them. Turnips in a good soil, well cultivated, and eaten before being too old, rotten or frozen, are seldom less beneficial, and perhaps quite as good as grass for fattening ; they make the flesh tender and well flavoured ; but when good food is given them in the troughs in the evening, it contributes still more to fatten them, and to making the flesh tender : it preserves them from sickness, which turnips in a moist soil will give them. Turnips, which are old and wormy, rotten or frozen, make bad food : an acre of good turnips, may fatten thirteen or fourteen wethers.

Q. How do they fatten wethers with cabbages ?

A. Wethers are put into fields of cabbages, de choux cavaliers, or de choux firises, from the month of October to February : cabbages fatten sheep sooner than grass, but they give a rancid taste to the flesh ; and when wethers eat old cabbages, their breath has a bad smell, which is perceived as soon as you draw near the flock. To prevent cabbages from inflating the sheep, and giving bad taste to the flesh, a sweeter food should be given them in their troughs, such as oats, peas, barley flour, &c.

Q. By what signs is it known, when a wether is fat ?

A. It is proper to feel of the tail, which sometimes becomes as thick as the wrist, and also on the shoulders and chest ; if the fat is there felt, it is a sign that the wethers are very fat. After having sheared them, the fat on the back appears in little bladders, like foam : it is a mark of good fattening, which commonly happens, when they have eaten turnips.

Q. Can fat wethers live for a long time ?

A. Sheep which have been fatted on herbage, or stall fed, will not live more than three months, if they should not be sent to the butcher : the water, which contributes to the fattening, will give them the rot.

Q. At what age is it proper to fat wethers ?

A. If fat, tender and well flavoured mutton be desired, it is proper to stall feed wethers at two or three years old. Two year old wethers have a small carcass and but little tallow : at four years old, they are thicker, and become much fatter, but their flesh is not so tender : at five years, their flesh is hard and dry : if, however, the profit of their fleeces and dung is

wanted, they may be kept still longer, even to ten years old, in a country where sheep live to that age ; but care must be taken to fatten them a year or fifteen months before the time they begin to decay.



CHAPTER XII.

ON SHEEP'S WOOL.

Q. At what time ought sheep to be shorn ?

A. In the spring there starts a new wool on the skin of the sheep : this is questionable in regard to the coarser wooled sheep and not true in regard to the fine wool of the latter, as the wool is formed by proportion from the root, that is protruded forward like hair : by removing the locks of the old wool the points of the new are perceived, and when it begins to push out, or shoot, it is then time to shear.

Q. What inconveniences would arise from shearing too soon ?

A. The wool would not be in its true state of maturity ; it would not have all the qualities, which it would acquire at the natural term of its growth. Sheep being shorn too soon in cold countries, would suffer injury from the air.

Q. What would be the inconveniences of shearing too late ?

A. When the new wool begins to appear, the old easily pulls out, and the least obstruction is sufficient for it ; therefore if the sheep rub against hedges or bushes, the branches catch some locks of the wool,

which remain suspended thereto, after being detached from the skin : the longer the shearing is delayed, the more the wool is pulled off.

Q. Has not late shearing other injurious effects ?

A. It is the occasion of another loss : when the wool has attained some lines in length, it is cut off at the time of shearing : although it might increase the weight of the fleece, the owner loses, instead of gaining by it ; because the intelligent purchaser and manufacturer knows, that this new wool, being very short, separates from the old, when it is worked : so much therefore is the price of the fleece reduced :— The new wool, being cut at the ends, is not so long as it ought to be the year following.*

Q. When the new wool makes its appearance, is there any thing to be done before shearing ?

A. There is nothing to be done, if the fleece is to be taken off without washing it ; but this is a bad custom : it is better to wash the wool upon the body of the sheep before shearing it ; it takes out the dirt, which fouls, and may spoil the fleece, if it remained a long time in the urine, dung, and mud, with which it is loaded. The owner knows the value of the fleeces better when he sells them at the weight, after they have been washed on the sheeps back, than if he sold them in the dirt. The purchaser under-

* Upon the fall and renewing of sheep's wool, the French editor, M. Huzard, recommends to be read, the account that citizen Tassier and he had made to the class of the National Institute, for mathematical and physical sciences, (8th and 9th years,) on the sale of wool, and on the fine sheep's wool of the flock of Rambouillet. It is the result of our observations and experience, that the breed of fine woolled sheep does not renew the wool annually....Huzard.

stands better how to purchase, than the owner to sell, for the reason, that the one sells only once a year, whilst the other purchases every day.

Q. How is the fleece washed on the sheep's back ?

A. Each sheep is forced into a running stream as high as the middle of his body, and the shepherd also goes into it, as high at least as his knees, and rubs his hand over, and presses the wool at different times, to clean it properly : this washing may be made in stagnant water, if it be clear. But in places, where there is only spring water, or that of wells or cisterns, it is sufficient to use it with pails. It is poured from a water-pot upon the wool of the sheep, pressing it with the hand ; but if a fall of water of three or four feet could be obtained, it should be received into a tub, in which the sheep should be alternately plunged : two men with their sleeves tucked up, or covered with false sleeves of glazed linen, would, in that case, wash them better, than in any other manner. The experiment of washing with spring water has been for many years tried, without the sheep deriving any inconvenience from the coldness of the water. The sheep, which are kept in the open air for the whole year, are often exposed to rains, quite as cold as a bath from spring water.

Q. What precautions should be taken before shearing the sheep which have been washed ?

A. It is necessary to wash them several times, in order that the wool may be very clean, and have a quick sale. After the last washing, the sheep should

be kept in a clean place, until sheared, which should not be undertaken before the fleece is dry, lest the fleece should be liable to damage, from being wet. It is proper, therefore, to omit the last washing, until fair weather.*

Q. What are the means of foreseeing fine weather ?

A. Country people have a great many signs for fine weather and rain ; but the most of them are either false or uncertain : they are unacquainted with the barometer, which is the best method of foretelling it : a well informed shepherd should be acquainted with it. Quicksilver is presented in a glass tube, which ascends and descends according to the state of the atmosphere. On the side of the tube, it is marked by inches and lines. When we look at the barometer, we should remark at what inch, or line, the quicksilver stands ; and return some time after, to ascertain if it rises or falls : if it has ascended, it is a sign of fair weather ; if it has fallen, it is a sign of rain or wind.

Q. What is the method of shearing sheep ?

A. Some are accustomed to tie the four legs together, to prevent them from struggling ; but it is a bad practice : when they are thus tied, the belly, and

* The washing the wool on the sheep's back is not in general use. it does not agree with and cannot be done in France on fine wooled sheep. It is desirable, that the farmers should all be accustomed to wash the wool themselves after shearing : they would thereby ascertain the exact loss, which takes place, and avoid the deceit of brokers and shopmen, to whom they are obliged to sell it, and who avail themselves of the waste not being known, to exaggerate it, and thereby obtain the wool at a lower price....*Huzar's*.

of course the bladder, are pressed in such a manner, that the dung and urine are discharged, and dirty the fleece. It is better to lay the sheep on a table bored with many holes near the edge, and to pass a cord through these holes in several places, so as to retain the fore legs in one place, and the hind in another; if it is a horned ram, one of his horns may be lashed to the table: by this means, the animal is less clogged, and the shearers work at their ease, and may be seated. This convenience is necessary for a work, which requires care and address; for the wool should be cut with shears, very near to the skin, but without wounding it. When the sheep is shorn on one side of the body, he is unlaced, turned, and tied on the other.*

Q. Is it proper to shear all the lambs?

A. It is best not to shear the weak lambs: in leaving them their wool, they are preserved from the accidents, to which they are liable after shearing, and are better clothed for the winter. Their fleece is larger the year following, and recompenses the loss in the first year.

Q. What proof is there of this recompense?

A. Six lambs were shorn at the end of June, 1773, only on the side of the head, neck, body, and tail. These half-fleeces were weighed, and the other halves

* Mr. Livingston, of New York, in a late essay on sheep, recommends to shearers, the tying the fore and hind legs to a bar with two cross pieces; the bar to be about eighteen inches long, and the cross pieces six. This would leave the sheep in their natural posture, with their legs a little stretched out: a rod of iron, with a curvature at each end, would perhaps be still better, because being smaller, it would be less in the way of the shears.

were left upon the lambs. The year following the same lambs being wholly shorn; and the half-fleeces weighed separately; that is, those a year old, and those which were as old as the lamb; it was found, in estimating the wool of these different shearings, that the part of the body of the lambs, which was shorn only once, had produced wool nearly to the value of that of the part, which had been twice shorn; the difference being only some sous (cents) more or less, upon each of the six lambs.

Q. What treatment is proper to be pursued after the sheep are shorn?

A. If some signs of the itch are perceived, it should be rubbed with an ointment made of grease or tallow, and the spirits of turpentine. If the skin has been wounded by the shears, the same ointment is good for such small wounds.

Q. How is this ointment made?

A. Melt a pound of tallow in summer, and of grease in winter; take it from the fire, and mix with the tallow or grease a quarter of a pound of the oil of turpentine, or more, if necessary, to cure the itch.

Q. What is to be feared for the sheep after shearing?

A. Great heat of the sun, and cold rains, for ten or twelve days after shearing: a hot sun hardens the skin on the back like horn, and disposes it to the itch; while cold rains give them cold, and chill them to the degree of producing death, if not speedily warmed.

Q. By what precautions may these dangers be avoided?

A. It is necessary to put them in the shade in the middle of the day, when the sun is very scorching. On the contrary, if cold, rain, or hail is to be apprehended, it is not proper to remove the flock far from the fold, lest it be necessary to bring it back speedily to put it under cover. This more rarely happens to sheep, which are always in the open air, than to others; for in a fold, which is situated in the department of la Cote d'or, near to Montbard, and where there have been no stables for thirty years, they have never been obliged to put sheep under cover after being shorn.

Q. How can the flocks be put under cover in folds, where they remain always in the open air, and where, of course, there are no stables?

A. If they are obliged to put flocks under cover after shearing, it is in a season when the barns are empty, which may serve as a retreat to sheep, to shelter or warm them.

Q. At what time, and in what manner, are the fleeces washed?

A. They are washed immediately after shearing, in the hottest days of July, because the water, being heated, cleans the wool better: the fleeces may be washed in running, and even stagnant water, if it be clear. They begin with picking off the straws, and other matters adhering to the fleeces, which are beaten to get out the dust; and the flakes are opened, in order that the water may more easily penetrate them. The wool is afterwards put into large wicker baskets, placed in the middle of the water, and stirred in dif-

ferent directions with a stick. It is finally taken out and put to dry on hurdles in the shade, because the heat of the sun would spoil the wool, by drying it too suddenly.

Q. Does the washing simply with cold water scour the wool?

A. Cold water produces no effect upon the natural grease of the wool.

Q. How is wool to be scoured?

A. A part of it is separated from the filth, or grease, by steeping it in a tub of warm water: they say, that the wool discharges in this water; it in fact gives out part of the grease, which ascends and swims on the surface of the water, and is scummed and strained off through linen cloth. The name of *œsipe* is given to the grease in this state, and it can be used for a lubricating ointment?

Q. How is wool fully scoured?

A. Warm half a bottle of urine with a bottle and an half of water for every pound of wool; steep the wool for a quarter of an hour, or half as much longer, keeping the baths, that is, the urine, at the same degree of warmth. It is known, that the bath has had its full effect, when the colour of the wool is the same through all the filaments of its flakes. Take out the wool and allow it to drain on the top of the bath for seven or eight minutes; afterwards put it in thick flakes of about a sixth of a pound, in an open basket placed in plain water: stir the wool with one or two sticks, placed in opposite directions, for five or six minutes: turn the wool upon a hurdle to dry

it, without ever touching it by hand. As the liquor of the bath diminishes, it should be replaced by an eighth of urine at the second and every succeeding addition. It is ascertained by the hand, if the bath is too weak or too strong.

Q. After the sheep is shorn, what is proper to be done with the fleece?

A. It is proper to put it in the air to dry; the drier it is, the less it is liable to spoil. It is afterwards spread in such a manner, that the side next to the body of the animal is found underneath, and all the edges are turned back upon the middle of the other or out side; it is then made into a bundle, and fastened at each end by some part of the wool being drawn out, by which it is tied together. The fleeces being thus disposed, they are put in heaps in a dry place, until the time for selling them.

Q. Is there wool of a different quality in the same fleece?

A. There are only three qualities of wool distinguished in common fleeces. The mother wool, upon the neck, and shoulders; the second wool, upon the sides of the body, and upon the thighs; and the third upon the throat, belly, tail, and legs. The superfine wools deserve more attention: in Spain they divide the fleece into four sorts of wool; (see plate.)—It has been discovered only a short time, that upon the sheep producing superfine wool, near Montbard, the wool of the tail and buttocks only, was of the second quality for fineness; and the wool on the end of the tail made the third quality. It remains to be known, if

the wool on the lower part of the sides, upon the chest, belly and legs are of an inferior quality to the wool on the neck, withers, back, and on the upper sides of the body, &c. in regard to other properties than its fineness: manufacturers may acquire this information by making experiments on these different wools.

Q. What insects are most injurious to wool?

A. They are moths.* This name is given to the little caterpillars produced by butterflies, which are also called moths: to distinguish them from other insects of the same name, they are called common moths: most people take moth caterpillars for worms, although they have legs like other caterpillars, whilst the worms have none. The butterfly moths are found in houses, where there is woollen furniture, or in stores of wool. They are nearly three lines long, and have a yellow, shining colour. They are seen fluttering about, from the latter end of April to the beginning of October; a little sooner or later, according to the warmth of the season. During the whole of this time, the winged moth lays his little eggs upon the wool, which can with difficulty be seen: it is from these eggs, the worms, which eat the wool, are produced.

Q. At what season do these caterpillars spoil the wool the most?

A. The winged moth hatches in the months of October, November, and December. They are very small, and grow but little at this season, and are even

* *Tinea Phalæna*, L.

benumbed in great frosts. But in the month of March and the beginning of April, they speedily grow large, and cut a great number of the filaments of wool, to feed and clothe themselves.

Q. How are the winged moths known?

A. There are seen upon the fleeces of wool, or in other places, little cases, about a line in diameter by four or five lines in length, and rarely six; they are a little swelled in the middle, and opened at the two ends. There is a moth in each of these cases, which keeps him under shelter, because he is clothed only with a white, thin, transparent, and delicate skin: the winged moth throws out one third of the length of his body from his case, by the one or other end, for it can turn in the middle, at the place where it is the largest: it can also come out almost wholly. There remains only the hinder part of the body and the two hind legs, which are attached to the case, in such a manner, that the caterpillar can draw it after him, while walking by the means of his other legs. It has only one third of its body without the case, when it cuts off the filaments of the wool; and turns itself round in different directions, to seize a greater number of them. It is fed by the substance of the wool, and uses it to make and enlarge his case; it on this account partakes of the colour of the wool, of which it eats. There is no doubt, there has been, and still are winged moths in the wool, when their excrement is seen, scattered underneath. It consists of little dry and angu-

lar grains, grey when the wool is white, and blackish when the wool is of that colour.

Q. How do the winged moths take the form of a butterfly?

A. When the winged moths have got their growth, the most of them quit the fleeces to withdraw into little obscure corners of the wool store, and attach themselves thereto by the two ends of the case, or suspend themselves to the ceiling by a single one. Then they shut the two openings of the case, and change both form and name, and take that of chrysalis. They remain in this state for three weeks; afterwards these insects bore the end of their sheath nearest the head, and come out in the figure of a butterfly.

Q. Can wool be preserved from damage by moths?

A. To this time, no means of certainly securing wool against damage by moths, have been found, but it may be in part avoided. Let your wool store be ceiled and white washed on the walls and sides, in order that the winged moths, that light upon them, may be more clearly seen: put the wool on hurdles, which may be supported at a foot above the floor, or pavement: have a stick with one end terminated by a covered button, like that of a fencing foil. When you enter the store, you must strike upon the wool and hurdles, in order to make the butterflies fly out, which will light upon the wall and ceiling, where it will be easy to kill them with the stuffed end of the stick. By often repeating this search between the end of April and the beginning of

October, a great number of winged moths may be destroyed : they are prevented from, or not allowed to complete the laying of their eggs, and of course there are not so many eating moths in the wool. A child is capable of taking care of it in this way.

Q. Are there not several methods of preserving wool from moths ?

A. It is known, that wool which is kept in its grease is less subject to be spoiled by moths, than that which has been scoured or only washed. If there be placed in a storehouse of uncleansed wool, some poor fleeces which have been cleansed, the moth-flies will lay their eggs in these fleeces, in preference to those which are uncleansed. If these fleeces are burned before the moths leave them to take the form of chrysalis, the caterpillars are destroyed, and thus prevented from becoming moth-flies, which would produce a great number of eggs.

It is pretended, that the smell of camphire or spirits of turpentine will preserve wool from moths. These smells may remove them, if they can find other wool ; but for the want of it, they will become accustomed to the smell of camphire and turpentine.

The vapour of sulphur kills winged moths ; but it is necessary, that it be concentrated within a small space. This cannot be done in a wool store ; particularly as it would give it a bad smell. The smell of camphire is also very disagreeable : it is better to beat the wool in the store, and to kill the butterfly moths : this is the method with the furriers, who, to preserve their furs, beat them, and pursue the butterfly-moths, as soon as they observe them.

Q. Can wool be so packed, as to give no dread of moths?

A. The winged moths cannot penetrate paper; so that wool is secure in a well-enclosed roll or sack of paper. But moths pass between the threads of linen, by separating them, and forming a small round hole, without cutting it.

CHAPTER XIII.

ON THE FOLDING OF SHEEP.

Q. **W**HAT is the folding of sheep?

A. It is that period of time, when sheep are put upon different pieces of land, for the purpose of fertilizing them with the dung and urine of the flock.

Q. How are sheep folded?

A. They are enclosed within a fence, made of hurdles, which is called a pen, or sheep-fold. This enclosure retains the sheep within a space of ground, that they can fertilize in a given time, and stops wolves. The shepherd lodges near the fold in a cabin to guard it: the dog also goes round it, in order to drive away the wolves.

Q. How ought the hurdles of a pen or sheep-fold to be made?

A. They should be made from four feet and an half to five feet high, and seven, eight, nine, or ten feet long, if they should not prove too heavy; for it is proper that the shepherd should be able to carry them easily: they are made from the small branches of the hazle tree,* or other light, flexible wood, interwoven

* *Corylus Sylvatica.*

with uprights, a little thicker than the branches: hurdles are likewise made of bars, put together, or simply nailed upon uprights. In hurdles of hazle wood, three openings of six inches square are made at the height of four feet, one of them being at each end, and one in the middle; those at the ends are called *voies openings*.

Q. How are these hurdles put up to form a fold?

A. They are put up one at the end of another in four lines, so as to form a square, and they are supported by cross pieces, which are bent at one of the ends. The hurdles lap a little upon each other, in such a manner that the two openings come together, and that the ends of the cross pieces may pass through them. The cross piece is bored with two holes, in which are put two pins, the one behind and the other before the upright: the other end of the cross piece is then brought down to the earth, and is bent and bored with a notch, in which a key is put, and driven into the earth with a mallet. Cross pieces are not necessary at the corners of the pen. It is sufficient to tie the uprights together with a line at the corners, where they touch each other, by passing it through the six inch square holes above mentioned.

Q. What ought to be the size of a sheep-pen or fold?

A. The size of the pen or fold should be in proportion to the number of sheep, which are intended to be put into it; because it is proper, that a flock should spread dung and urine enough to fertilize the ground enclosed: each sheep can manure ten feet

square : of course, if the hurdles are ten feet long, twelve hurdles will be necessary for a fold of 90 sheep, 18 for 200, 22 for 300 : if the hurdles are only nine feet long, two hurdles more will be wanting for each of the pens or folds ; four hurdles more, if only eight feet long ; and six more, if their length is only seven feet : for a fold or pen for fifty sheep, 12 hurdles of seven or eight feet, or ten hurdles if nine or ten feet long are necessary, &c. These calculations cannot be precise ; because, there may be a few sheep more or less for the number of hurdles. When the number cannot be made equal on each of the four sides, there should be upon the two opposite sides, a hurdle more than upon the two others.

Q. How long is it proper for a flock to remain in a fold ?

A. That depends on the length of the nights, and on the quality of the grass. When the nights are long, and the grasses, which the sheep eat, are very succulent and produce a great deal of dung and urine, the half or a third of a night is enough to manure the ground of the pen : if it was made larger, the manure would not be equally spread : on this account, the shepherd makes a second pen in the middle of the night, and sometimes a third.

Q. When there is but a small number of sheep, can they be folded ?

A. There is nothing but the expense of the shepherd to prevent it. The produce of a small flock would make it unprofitable : but a number of small flocks may be collected, and put under the manage-

ment of a shepherd to be folded. There are farmers, who for wages will take charge of many small flocks, and put them together, for the sake of folding them upon their lands: others, each of whom having only a small flock, unite them together, and have them folded at a common expense upon the lands, which belong to each, individually.

Q. When we have only a small quantity of land, is that a proper reason for not folding?

A. No, because it only requires the hurdles and the shepherd's cabin to be oftener carted. This carting is a small expense, compared with that of carrying out the manure, on ground, where sheep are not folded. It requires a number of cart loads of dung for an acre of land; and a single load is sufficient to transport the hurdles of a pen, and the shepherd's cabin attached to the tail of the cart.

Q. In what manner does a shepherd make a pen?

A. He places himself at one corner of a field, and measures, by paces, the space necessary to place the hurdles on two sides of the fold, at the end, and on the length of the field, and marks the point, where the last hurdle should come, and then measures the other two sides of the pen to form a square, making a mark at the place, where these other two sides meet, and sets the hurdles according to these lines: to carry each hurdle, the shepherd passes the end of his crook through the middle opening in the hurdle, leans his back against it, and raises and carries it, by putting the crook on his shoulder, and holding it fast with both hands: the hurdles may be also carried by

passing the right arm through the middle hole, or under the last piece but one of the hurdle bars. After placing it, he supports it by one of the cross pieces.

Q How does a shepherd make a new pen, by the side of another?

A. One of the sides of the first pen answers for the second: after measuring and lining out the hurdles on the three other sides of the second pen, he carries thither the hurdles of the first: when he has reached the end of the field, after having precisely followed it through its whole length, he makes a new folding on the side of the last, by returning on a new line quite to the other end of the field; and proceeds in this manner, until there remains no space, which he has not folded.

Q. How can a shepherd make a new pen in a dark night?

A. It is necessary, he should take the precaution to measure the new pen in the day time, and to place a stake at each corner, with white rags tied to the end of it, that he may see them in the night, and be directed in the manner of placing the hurdles of the new pen. This difficulty may be avoided, by making a double sized pen in the day time, and dividing it in two, by a partition of hurdles. The shepherd has only to change the pen in that case, by driving the sheep from the one to the other.

Q. In fields having deep furrows, how can the shepherd range the hurdles upon the sides of the pen, which cross the furrows?

A. He cannot, if the precaution has not been taken to level the ground with a plough, by cross furrowing

at such places, where the sides of the pen should be placed: in this way a great number of pens could be marked out in a single day.

Q. In what manner should a shepherd's cabin be made?

A. It should be six feet long, and four feet broad, and high, covered with a straw or shingled roof; and be placed on four small wheels, and have a door with a lock on each side: a matrass should be put into the cabin, with sheets and blankets, for the shepherd to lie on, and a shelf, on which to put clothes and provisions.

Q. Where ought this cabin to be placed?

A. Near the pen, in order that the shepherd may see it from his bed by opening either the one or the other door. When the new pen is too far off, the shepherd draws his cabin nearer, by rolling it himself, if the ground is smooth, or by having the assistance of another person.

Q. During what length of time do they fold sheep every night?

A. They are turned into the fold at the end of the day, or at nine in the evening when the days are long, and there is no evening dew; and turned out again at nine in the morning, after the air and sun have dried the grass, or at eight when there is no dew.

Q. At what hour is it proper to change the pen in the night or morning?

A. In the season, when the sheep discharge a great deal of dung and urine, from eating very succulent grass, each folding should continue only four hours: thus, if the first folding begins at nine in the evening,

it should terminate at one in the morning; the second at five, and the third at nine o'clock: this last folding, being in the day time, the wolves are not so much to be feared; it is on this account, that the shepherd may dispense with making the enclosure: it is sufficient to place the dogs in a manner, that they may detain the sheep within the space designed for the third pen; this is called blank folding. When the nights are long, and the first folding begins at nine in the evening, each folding is made to continue so much longer. In the seasons, when the grasses have less sap, and the sheep discharge less dung and urine, the shepherd shifts the folding only once; he endeavours to allow as much for the first as the second folding. If they are folded in winter, a single folding can only be made once a day, because at this season, the sheep discharge but little dung and urine, and the cold does not allow the shepherd to change his fold in the night.

Q. Can sheep be folded in winter?

A. Sheep may be folded in winter, on dry land, so long as the shepherd is not incommoded with the cold, in sleeping in his cabin: but in winter, when the sheep have dry food only, they discharge but little dung and urine.

Q. Can the dogs be sheltered from rain and cold?

A. It is necessary to have a little kennel, that the shepherd can easily carry. The dog lies in it, on hay. It should be placed near the fold, on the side opposite to the shepherd's cabin. The door of the kennel should be towards the fold, and to windward, because the door of the shepherd's cabin should be to leeward,

and sheltered from the wind. To give the dog shelter, it is proper to put before the entrance of his kennel a piece of board, as high as the body of the dog, when lying down; in raising his head, he will see over the board, and will jump upon it, in going in and out of his kennel. If you have many dogs, the kennel must be proportionably larger.

Q. How are sheep led to pasture, when folded in the fields?

A. They are driven to pasture, morning and evening, and put in the shed at mid-day, to keep them from the heat of the sun.

Q. How much time is necessary to manure an acre of land, of thirty-four square perches?

A. That depends on the number of sheep, and on the season of folding them. A sheep can manure at one folding the space of ten square feet. Three hundred sheep will manure three thousand square feet in one folding, and thirty thousand in ten; which is nearly the space of an acre: when three foldings are made in one night, three hundred sheep will, in three or four days only, manure an acre of land. According to the same calculation, two hundred and seventy sheep will manure an acre of ground in twelve foldings; two hundred sheep in seventeen foldings, and an hundred sheep in thirty-two, &c.

Q. What is the least number of sheep, which can be folded?

A. A very few in number may be folded, but much time would be required to manure a field; and perhaps it might not be worth the trouble: it is

proper to have at least fifty or sixty sheep for folding; it is, however, when the shepherd is a child of the house, and the folding costs nothing more. Fifty sheep in a fold manure about five hundred square feet; sixty-five foldings are therefore necessary for an acre of land: if three foldings are made every day, twenty-two days will be required; thirty-two, if only two foldings in a day; and sixty-five, if only one.

Q. In what manner is it proper to cultivate the land for folding?

A. Before the folding takes place, two ploughings should be given, in order that the urine may readily enter the soil: as soon as the field is manured by folding, it should be ploughed, for the purpose of mixing the dung and urine with the earth, before it dries, or is evaporated.

Q. Cannot the folding be done at other times?

A. When a field is sown and the grain is up, it is said, that you can fold in dry days, until the wheat or barley may be an inch high: it is said also, that sheep are beneficial, in treading the dry earth about the roots, and in dispersing the worms by their dung.

Q. How long does the manure from folding last?

A. The folding is better for manure than the dung of sheep simply: it in fact produces a very visible effect for two years, in the produce of wheat for the first, and in that of oats for the second year: half a folding made on the same land for a third, which is fallow year, will be a good manure enough for other years.

Q. How is a half folding done ?

A. Double space is given to the pen, that it would have had for whole folding : but many farmers omit the half folding, which should be done two years after the whole folding ; because they would not have sheep enough to twice fold all their land : in this manner, they do not draw all the profit from folding, which it would give.

Q. Can these farmers find means for feeding sheep enough to fold a greater extent of land ?

A. It would be necessary to sow the lands usually put to fallow, instead of leaving them to be run over with the weeds, which grow on them.

Q. Would not lands of a middling quality be exhausted, if they were made to produce every year, without giving them rest, after taking off two crops ?

A. It is said that the grasses, which grow in fallows, and whose roots run near, and over the surface of the ground, hurt the crop of wheat, that is sown in the same land, because it has horizontal roots. But if the land was sown with good plants, whose roots go deep into the soil, such tap rooted plants would not hurt the crop of wheat in the following season : on the contrary, they would prevent the running plants, which come in fallow ground. In this manner, a crop may be had for the feeding of sheep.

Q. What are the tap rooted plants, which might be produced on fallows, without hurting the wheat harvest of the year following ?

A. Peas, beans, haricot beans, potatoes, turnips, trefoil, &c.

Q. Can one become acquainted with the lands, which would produce every year without fallowing, and know how much folding would be necessary sufficiently to manure them ?

A. The guide of experience alone is secure : it is proper to make experiments upon a small piece of ground. Each farmer might hope to find, almost without expense, a better method of managing his land, than is practised in the neighbourhood : soils are very different from one another, and each requires a particular culture : this object is of sufficient importance to claim the attention of farmers, and men of landed property.

Q. Is folding good for pasture land ?

A. Excellent ; but it would be hurtful to sheep on wet soils : no risk is run on dry pastures, and they render them fruitful. By this means abundant crops of hay may be had on hilly land, when, without folding, there would not be grass enough for mowing.

Q. What proof is there of this effect from folding ?

A. Artificial grasses have been produced in the department of Cote d'or, near the town of Montbard, upon hilly land, where without folding there would not have been grass enough to mow. In fact, there was none in some small places, which had remained without being folded. These pastures have produced as much hay, and sometimes more, than a natural meadow at the bottom of the hilly ground, on the banks of the river Brenne.

Q. How should the meadows be folded ?

A. They cannot be too much folded : the longer

the folding is continued on them, the more they will produce. In dry weather the sheep may be left two or three nights in the same place ; but in wet weather, you must change it every day, because the dung of the evening, not being dried, would dirty the sheep.

Q. On what sort of artificial meadows has the folding been tried ?

A It has produced an excellent effect upon meadows of lucern, trefoil, quitch grass, ray grass, sheep grass,* burnet and woad ; but in saintfoin meadows this plant has been known to die in places where sheep had been folded : on the contrary, quitch grass and ray grass, on which they had been folded in the month of October or November, became vigorous enough to preserve their verdure during winter ; notwithstanding the plants of the same kind, on which sheep had not been folded, grew yellow from the frost.



CHAPTER XIV.

ON THE REMEDIES, WHICH ARE MOST NECESSARY FOR SHEEP.

Q. **W**HAT are the most necessary remedies for them ?

A. Bleeding, and an ointment for the itch or scab.

Q. On what part of the body are sheep bled ?

A. Sheep are bled on the forehead, above and

* *Festuca ovina*, L.

under the eyes, in the ear, neck, fore leg, above the ham, and in the feet.

Q. Has a better method of bleeding sheep been discovered ?

A. Another method of bleeding, which appears to be best, has been obtained : it is easier and less liable to inconvenience.

Q. On what part of the body is this new method of bleeding performed ?

A. This bleeding is made at the under part of the sheep's jaw, at the root of the fourth grinder, which is the thickest of all the teeth, as is also the root : the space, which it occupies, is marked upon the outer surface of the bone of the upper jaw, by a small swelling sufficiently projecting to be very sensibly felt by the finger, when you touch the skin of the cheek. This tubercle is a very certain index to find the angular vein, which passes under it : this vein extends from the lower edge of the under jaw, near its angle, quite under the tubercle, which is at the root of the fourth grinder ; a little further on, the vein is bent back, and continued quite to the hollow of the eye brow.

Q. In what manner are sheep bled in the cheek ?

A. To bleed in the cheek, the shepherd begins by putting an open lancet between his teeth : he then places the sheep between his legs, and ties him to restrain him, keeping his left knee a little forward of the right ; and passing the left hand under the head of the animal, while he grasps the under jaw, in such a manner, that his fingers placed upon the right

branch of the under jaw, near its hinder end, compresses and enlarges the angular vein, which passes in this place; the shepherd then takes hold of the right cheek of the sheep with the other hand, nearly at an equal distance between the eye and the mouth; and the tubercle or swelling will be there found to direct him; and he will perceive the angular vein enlarged under it. He then takes the lancet from his mouth with his right hand, and makes the orifice for bleeding from the bottom upwards, half a finger's breadth under the middle of the swelling, which will serve to guide him: it may be said without exaggeration, that in this manner, a blind man might be able to bleed a sheep, because he would feel with his fingers the tubercle, which would direct him in making the incision.

Q. Is the bleeding in the cheek safe and advantageous?

Q. The bleeding in the cheek is both easy and safe; as the situation of the vein cannot be mistaken, and it is large enough to afford a sufficient quantity of blood; because it receives it from several other veins; and the blood is retained there by the hand of the shepherd, which has the effect of a ligature, at the angle of the jaw. There is no risk of opening the artery; it is some distance between that and the vein at, the place of bleeding. A man may go through this operation without assistance.

A. What is the disease in sheep which requires immediate bleeding.

A. It is the disease, which is called the heat, the

apoplexy, trembling, too much blood, &c.: sheep resist all intemperature of the air in our climate, except the extreme heat of the sun: The sheep, which are the strongest, fullest of blood, and best fed, are most liable to disease from heat.

Q. What are the signs of disease from heat?

A. Such, as are attacked with it, keep their mouth open to breathe; they foam at the mouth, discharge blood at the nose, rattle in the throat, and beat at the flank; the ball of the eye becomes red; the animal keeps his head down, trembles, and presently falls dead. After death, the eyes, the lower part of the cheek, the nether jaw, the throat, the neck, the inside of the mouth and nose, have a red and blackish colour mixed: on opening the animal, the blood vessels are found swollen in all parts, and in the head.

Q. What inferences ought to be drawn from these signs?

A. These signs evidently point to bleeding, which causes the evil to subside very readily, if done seasonably. This remedy is one of the most necessary for a flock in warm climates, in temperate climates like ours, and even in cold climates, when the sun has great power in summer.

Q. What are the symptoms, which should lead to the suspicion, that sheep have the scab or itch?

A. The shepherd should be attentive to discover the first indications of the itch; should carefully observe his flock, to see if some sheep do not scratch themselves with their feet or teeth, or rub themselves against the rack, trees, or walls, &c.; or if the wool

is not dirted in parts of the body, that the animal can reach with his feet ; or if there are not some flakes of wool deranged by being pulled by the teeth, or rubbed by the feet : these signs indicate itching from lice, itch, or some other disease. It is proper, that the shepherd should examine the sheep by separating the flakes of wool in suspicious parts, to observe if the symptoms of the itch are real.

Q. What are the indications of the itch ?

A. They consist in the skin being harder in the itchy than in the other parts : hard kernels are felt, and the skin is covered with white scales, scabs, or small pimples, which are at first red and inflamed, and afterwards become white or green—all these symptoms cause itching : but there is another species of itch or humours, which does not excite to rubbing : it speedily spreads under the wool, and instead of making it fall off, discolours and felts it, as though it had been fulled.

Q. What is the best ointment for the cure of the itch ?

A. It is that, which is the least costly, and which imparts no bad quality to the wool, or to the flesh of the animal : a mixture of tallow or grease with oil of turpentine answers these purposes : the grease is to be preferred to tallow in winter, because it spreads easier upon the skin ; but the tallow is best in summer, as it does not melt so soon as grease in the heat. It is very easy to make this compound, the particulars of which are given in the twelfth chapter, page 108. This ointment costs but little, produces no bad

effect upon the wool, softens the skin when hardened by the itch, and cures it. The application will be made more powerful by increasing the oil of turpentine.

Q. How is the ointment used for the itch ?

A. It is easy to use it without cutting off the wool from the diseased part: it is sufficient to separate the flakes so as to expose the itchy part, when the shepherd rubs the skin with his scratcher, only to remove the scabs, and then applies and spreads the ointment with his finger.

Q. Is the scratcher sufficient for rubbing the skin diseased with in the itch ?

A. There is a bad custom of rubbing the skin of scabby sheep with a tesson, or a piece of brick, until it bleeds; a small wound is thereby made, which increases the evil: our author furnished his shepherd with a single instrument, which he says is sufficient for all the operations to be performed on sheep: it is a sort of incision knife, made sharp on each side of the point, and answers for a lancet; while at the end of the handle is placed a blade of bone or ivory, to be used for a scratcher.

Q. Under what circumstances, is it proper to use the ointment for the itch ?

A. When some signs of the itch appear, it is proper to use the ointment, immediately: however, if it is supposed that the disease proceeds from fatigue, or from the heat of stables, from the scarcity or bad quality of food, it is necessary to remove the cause of the evil, because it would be adverse to the effect of the

application. If the itch is caused by another disease, both ought to be cured at the same time. When the itch is not inveterate nor ulcerated, it may be cured by external application, without inward medicine.*

* The true and almost only causes of itch in sheep are the ignorance, laziness, and want of care in shepherds, and the carelessness and parsimony of proprietors. A flock well taken care of, well fed and attended to, is never attacked with this disease : if some animals show symptoms of it, an intelligent shepherd and careful proprietor will promptly apply the remedies, before the disease should spread in the flock.

CHAPTER VIII.

On the Breeding of Sheep, and their Improvement, 65

CHAPTER IX.

Concerning Ewes, - - - - - 78

CHAPTER X.

Concerning Lambs, - - - - - 85

CHAPTER XI.

Concerning Wethers, - - - - - 95

CHAPTER XII.

On Sheep's Wool, - - - - - 103

CHAPTER XIII.

On the Folding of Sheep, - - - - - 116

CHAPTER XIV.

On the Remedies which are most necessary for Sheep, 127

TABLE

OF GENERAL CONTENTS.

	Page
<i>Preface,</i> - - - - -	3
CHAPTER I.	
<i>On the Qualifications of a Shepherd,</i> - - -	7
CHAPTER II.	
<i>Of Dogs and Wolves,</i> - - - - -	10
CHAPTER III.	
<i>Of the Lodging, Litter, and Dung of Sheep,</i> -	18
CHAPTER IV.	
<i>On the Knowledge and Choice of Sheep,</i> - -	28
CHAPTER V.	
<i>Concerning the Management of Sheep in Pastures,</i>	36
CHAPTER VI.	
<i>On the different things which may be used for the Feed- ing of Sheep,</i> - - - - -	46
CHAPTER VII.	
<i>On the Manner of breeding Sheep, and giving them Water and Salt,</i> - - - - -	57

EXPLANATION
OF THE
SEVERAL PLATES.



PLATE I.

THE annexed plate represents one of the most perfect Merino Rams which has been sent out of Spain. He was supposed to combine all the superior qualities of the Spanish sheep, with the fine square form of the English.*

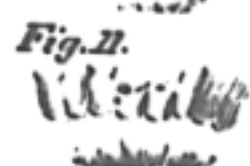
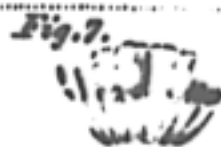
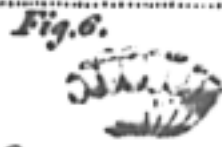
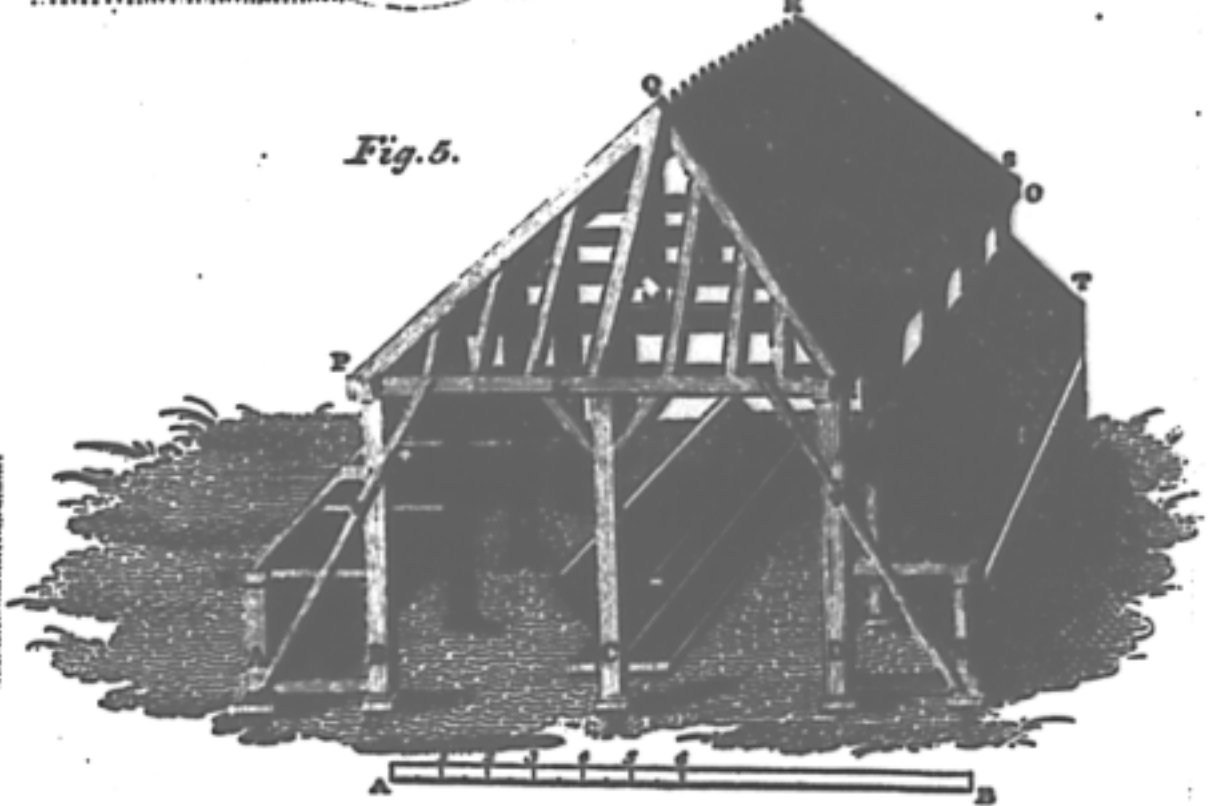
* From the specimens which have been imported into the United States, the Merino breed is rather smaller than that of New-England, not so well shaped, having a larger head, a longer neck and legs, and smaller body, flat-sided, narrow across the hips, and an unnatural throatiness, descending from the chin to the breast bone, not unlike the loose, flacid dewlap of an ox: the rams have commonly large spiral horns, full and lively eyes, and an intelligent countenance; a soft, loose and thin skin of a bright carnation, or vivid flesh colour, covered with a thick, close pile of wool greatly superior in fineness and flexibility to that of any other sheep. On the outside, and for half an inch within, the wool has a dark greasy appearance, owing to the quantity of yolk or grease it contains, which absorbs the dirt of the soil on which the sheep are kept, whilst on the inside it has a bright white colour slightly tinged with yellow.

“This animal,” says Dr. Parry, “seems buried in wool, it crests on the forehead almost as low as the eyes and on the cheeks, covers their bellies, and envelops their hind legs and sometimes their fore legs down to their very hoofs.”

The length of the staple or filament, is from two to somewhat more than three inches, being much alike on the shoulder and on the rump:—the wool of the ram is generally esteemed the coarsest and longest, that of the ewe the finest and shortest, and that of the wether in both respects, between the two former.

In proof of this fact it appears by Dr. Parry’s excellent treatise on Merino sheep, that “this breed has been naturalized in Sweden, Denmark, Prussia, Saxony, Silisia, Hungary, Austria, Hanover, Holland, England, Bayreuth, Anspach, Wirtemberg, Baden, France, Switzerland, Piedmont, the Cape of Good Hope, and New Holland, comprehending a range of latitude from 59° 20’ North to 34° South, and includes countries some of which are elevated, others low; some dry, others swampy; some open, others inclosed and woody; some rich, others poor; some hot, others temperate, and others intensely cold: In one country this breed is exposed during the whole year to the external air, and to all the vicissitudes of weather, and exercises itself at will. In another it is constantly housed during the night, and sheltered from every storm, and for six or seven months never uses its limbs or inhales the open air, but during a part of the middle of every fine day, and even in Spain, many of the finest of the Merino breed never travel.

“The food of this race is as various as its climate and exercise: here it lives the whole year chiefly on natural and fresh grass; there it obtains in winter, the addition of hay: in Spain it feeds not only on the fine herbage of the mountains, but on the succulent grass of the richest meadows, and occasionally on the leaves of vines and other trees, and all the variety of plants in the fallow, or stubble fields. In other countries it is variously fed on clover, Lucern, Sainfoin, Burnet, vetches, succory, reeds, the leaves of different trees, and the haum of plants, all



“ sometimes fresh, at others dried ; the fruit and husk of the
 “ horse chesnut, bran, potatoes, carrots, beets, beans, grain of all
 “ kinds, and every sort of turnips and cabbages. To these kinds
 “ of food some proprietors of flocks add salt water and other me-
 “ dicaments ; others use them occasionally, and some entirely
 “ omit them.

“ Under this diversity of climate, soil, and treatment, than
 “ which the mind can scarcely picture a greater, the Merino race
 “ of sheep has been found by experience to thrive and produce
 “ wool, which is, in every respect, fully equal to the very best of
 “ the native growth of Spain. These facts prove that it is the
 “ peculiarity of breed, which we are to consider as chiefly pro-
 “ ductive of fine wool, in spite of the operation of other causes ;
 “ and that the Merino breed is capable of bearing its transcend-
 “ ent fleece in this^v or any other country, in which it can subsist
 “ in sound and robust health.”

M. de Lasterie observes, that the fine wools of Spain depend
 neither on travelling, nor on the soil, nor the climate, nor the
 pasture, but on other causes, and that it is possible to have in
 France and elsewhere wool of the same quality, as that of Spain ;
 that his travels in the north of Europe have offered facts and ob-
 servations, and prove, that where sheep can be maintained, that
 wool may be raised, which will make clothes as fine, as silky
 and supple as those manufactured from Spanish wool.

 PLATE II.

Figures 1, 2, 3, 4, exhibits four lambs in different situations
 upon the placenta or after births, A, A, A, A, and represent them
 issuing from the matrix, when the ewes are in labour to cast
 their lambs.

Figure 1 represents a lamb discharging from the matrix, in regular position, having the two fore feet underneath, and a little in advance of the muzzle, and the ombilical or navel cord B, free.

The lamb, figure 2, has the two fore legs improperly placed, the left leg B, being improperly raised and stretched out over the head, should be brought down under the muzzle. The right leg C, is stretched out behind, and the shepherd should endeavour to draw it forward, in order that the two fore legs should be placed in the same situation as those of the lamb, figure 1.

The lamb, figure 3, presents the crown of the head before, with the muzzle C, turned backward, but the muzzle should be placed before, in the same situation as the muzzle of the lamb in fig. 1.

The lamb figure 4, has the right fore leg retained by the ombilical or navel cord, C, which passes before the curve of the joint B. The navel string should be broke, and the right leg drawn before, and placed by the side of the left leg E, in order that both legs may be in the same situation as those of the lamb in figure 1.

Figure 5 represents a cheap covered cot, for the purpose of sheltering sheep from rain.

The timber work of this sheep cot, is supported by the posts A, B, C, D, E, which are placed upon the stone bases, F, G, H, I, K.

The posts, A, B, C, D, E, are attached to the beams, L, M, and to the plates, N, O, which support the roof, P, Q, R, S.

A little shed, T, T, placed on each side of the building enlarges its space, without its being necessary to use longer or heavier timber.

The braces, U, U, attached to the posts and cross pieces, prevent the work from spreading.

In the middle of the cot there is a double rack, X, and two single ones, Y, Y, on the sides, next to the posts of the little sheds.

The scale, A, B, will serve to shew the length and thickness of the timber, which should be used in the construction of this building. The figures 1, 2, 3, 4, 5, 6, which divide a fathom into six equal parts, contain each one foot French, and there is a mark between each which divides each foot.



By the means of this scale the size of the cot, and of the timber proper for its construction, may be ascertained.

It will be seen in the third chapter, (page 21,) that the above sheep cot is calculated only for sheep of a middling size, and that it must be enlarged, if wanted for larger sized sheep.

Figures 6, 7, 8, 9, 10, 11, of plate II, shews the age of sheep, and the manner in which they change their teeth.

In the first year, the eight cutting teeth, (fig. 6,) are narrow and sharp, and are called lamb's teeth.

In the second year, (fig. 7,) the two middle teeth fall out and are replaced by two new ones, which are broader than the six others.

In the third year (fig. 8,) two other sharp teeth, one on each side of the two middle ones, are replaced by two new broad teeth.

In the fourth year, (fig. 9,) there will be six broad teeth, and there will remain but two narrow teeth, one at each end of the row.

In the fifth year, (fig. 10,) all the sharp teeth are replaced by eight broad teeth, when a sheep is said to be full mouthed.

In the sixth year the grinders begin to be worn down by rubbing against each other.

In the seventh or eighth year, and often sooner, some teeth will commonly fall out, or become broken, as represented in fig. 11.

See the 4th chapter, pages 28, 29.



PLATE III.

Represents a shepherd A, (fig. 1.) holding a knife, B, and beginning the operation of castrating a female lamb, C. This lamb is laid on its right side near the edge of the table D, E, in such a manner that the head of the lamb F, should hang off the table.

A second shepherd G, is placed near the head of the lamb, k, and holds with his right hand the two fore legs and the right hind leg H.

A third shepherd, I, holds with both hands the left hind leg of the lamb K, and stretches it behind.

The shepherd A, raises the skin of the left flank with the thumb and fore finger of the left hand, and forms the fold L, at an equal distance from the highest part of the haunch bone and navel M. The shepherd G, lengthens the fold L, with the left hand, quite to the place N, of the false ribs. The shepherd A, cuts this fold with the knife B, and makes an incision, which ought not to be more than an inch and an half long.

Figure 2 represents the same lamb in the same situation, and retained in the same situation by the shepherds as in figure 1.

The incision O, which had been made on this lamb seen at A, is placed at an equal distance from the upper part B, of the haunchbone, and from the navel C, and on the same line.

Figure 3 represents the hand, A, of a shepherd introducing his finger into the incision B, and searching for the ovaria of the lamb, as soon as he has found them, he gently draws them out with the parts to which they are attached, the shepherd cuts off the ovaria and puts back the other parts into the belly, and in fine sews up the incision as mentioned in the 11th chapter, pages 96, 97.

C

- Cabbages**, fresh food for sheep in winter, 48. In some cases prove injurious to sheep, *id.* What quantity should be given at a feeding, 58. Good to prevent the ill effect of dry fodder, 48. Make ewes increase their milk, 84. Different and best kinds, 48.
- Cabbin**, for shepherds, its description and situation, 121.
- Cakes**, oil, what are the best for sheep, 51.
- Camphire**, its smell, a preservative against moths, 115.
- Carrots**, preferable to colewort or cabbages, 49, 84. Good for milk, 84.
- Castration** of lambs, at what age, 89, 96. Different methods of doing it, 94. Precautions to be taken, 94, 95. Accidents which sometimes happen, 95.
- Chaff** of grain, how used, 56, 57. Of peas, beans, vetches, &c. 52. Of hay, hempseed, broomseed, acorns, &c. 50.
- Chalk** preserves lambs from scouring, 89.
- Cheese**, made from ewes' milk, excellent, 84, 85.
- Choice** of rams, 78. Of sheep, 33, 34.
- Cold**, how shepherds should treat parts benumbed with it, 9. How sheep guard against it, 23, 24. Experiments which have been made to shew that sheep can resist it, 23. When extreme will destroy lambs, 65. Method of restoring lambs benumbed with cold, 88, 89.
- Colewort**, fresh food in winter, 48. May prove injurious in some cases, *id.* Oil cakes made from the seed, and their use, 51.
- Colick**, produced by wet, 38. Of the paunch, 42.
- Collar**, for shepherds' dogs, how made, 16.
- Colours**, in wool, what are bad, 30.
- Composition** of a topical application preferable to any other for the scab, 108.
- Consanguinity** is not an obstacle to bettering the breed of sheep, 74.
- Coupling**, what is the best time for it, 65. Means of rendering it most effectual, 65.
- Crook**, its form and uses, 9, 44.
- Cuckolds**, why lambs are so called, 89.
- Culture of land**, folding is proper for it, 119.

D

- Defile**, how a shepherd makes his flock to pass one, 45.
- Dew of the morning**, more injurious to sheep than rain, or the dew of the evening, 33. Why more so than snow, 63.
- Disease**, what is done with weak sheep when lodged in the open air, 24.
- Disgust**, and want of appetite, the causes of it, and salt its remedy, 64.
- Drink**, injurious when taken too often and in too great quantities, 58. Sheep can remain a long time without it, *id.* At what time it should be given, *id.* Experiments made thereon; the less sheep drink the better, *id.* A drink to be given to ewes, when too weak to year

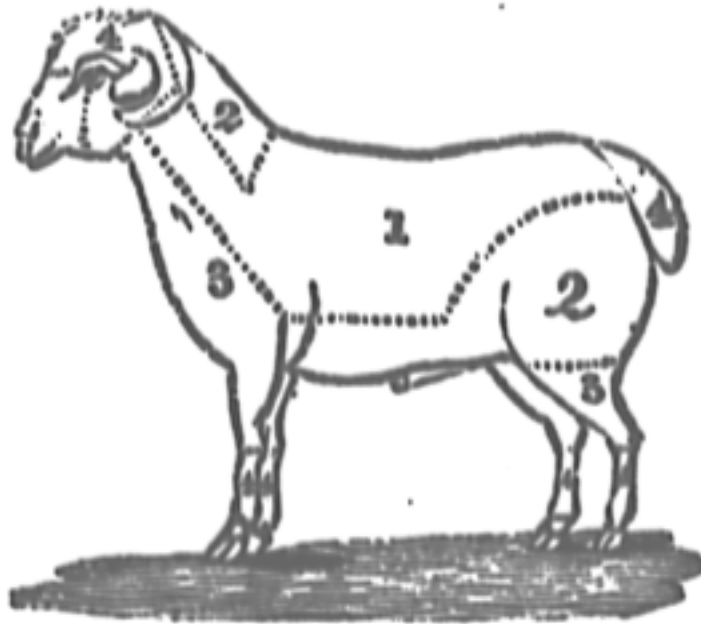


PLATE IV.

IN plate 4, will be seen the Spanish method of sorting sheep's wool; it is taken from M. Delasterie: the parts of the sheep, which furnish the different qualities of wool are included within the corresponding lines, and indicated by the figures 1, 2, 3, and 4.

Note. Dr. Parry observes, that it was many years supposed that in a pile of Spanish wool the proportion of the three principal parts was *refina* or superfine, 15 parts, *fine*, 4, and *sercero*, or third sort, 1. Even in this case, he says, the fleece must have been sorted more coarsely, than is expressed in the drawing. Of late years, he adds, as the wool has risen in price, the quantity of the finer sorts has been increased, and their quality proportionably deteriorated by the admixture of those of a lower value. This, he says, is well known to our (the English) manufacturers and venders of superfine cloths. Part of what

should be fine is mixed with the superfine, and the third sort probably borrows of the fourth. Hence, he states, of the wool imported from Spain into England, in 20 parts of wool, the superfine now forms from 16 to 17, the fine $2\frac{1}{2}$ to $3\frac{1}{2}$, and the third sort from $\frac{1}{2}$ to $1\frac{1}{2}$. It is even probable, that the weight of the sheep's wool is at this time augmented by the addition of parts of that of the lambs, in spite of the prohibition of that practice by law, in the provinces of Leon and Segovia. Perhaps too, none of the sorts are without a mixture of the wool of those sheep, which have died of disease before the time of shearing.

▲
GENERAL AND ALPHABETICAL

TABLE OF CONTENTS.

▲

- ADOPTION of Lambs*, by other dams than their mothers, page 86.
After birth, what it is, its use, and how it is to be extracted, 82.
Age of Sheep, how known, 28.
Air, much of it required, 19. Sheep resist its injurious effects, 22, 23, 24. When sick should be sheltered from it, 24.
Air, cold, its bad effects on sheep going out of warm stables, 18.

B

- Barometer*, a short description of it, and the manner of using it, 106.
Bark of Trees given to sheep, and the manner of preparing it, 56.
Barley, when green, may prove injurious to sheep, 42. The grain used for their food during winter, 50. Meal or flour disgusting to sheep, 90. Is good for lambs, 87. And is used for stall-feeding, 101.
Barley straw, if bearded, may be injurious to sheep, 56, 57.
Bells, put on the necks of sheep. of what use, 17.
Barrenness of ewes, to what attributed, 73.
Beans, small, given to sheep, 51. Bean chaff and straw also given, 52, 56.
Beets, (white.) or *scarcity root*, given, 49.
Birch-tree leaves, good for sheep, 53.
Box, a tin one, for ointment, 10.
Bleeding, good for sheep having a disease called the heat, or if overheated, 39. For the colick or inflation of the paunch, 43. When ewes cannot cast their lambs from too much agitation, 79, 80. One of the most necessary remedies, 127. Different methods of, 128. A new method preferable to all others, *id.* In what diseases it is most necessary, 129, 130.
Bruces, to support the sheep-fold, 117.
Brine, the use made of it for sheep, 64.
Burnet, stands the winter, 47. Is an artificial grass, 54. Its qualities, 55.

their lambs, 75. To be given lambs as a substitute for milk, 67.

Necessary to sheep and other animals when fattening, 99.

Dogs, are they proper for driving sheep? 10, 11, &c.

Dung, from a home fold, is it as good as that from a stable? 27.

E

Effusion of water, or serum, sheep very liable to it; drinking too much the cause of it, 62, 63.

Elder, its leaves very good for sheep, 53.

England. Sheep remain all winter in the open air. Withdrawn from snow after being covered with it for many days, 28, 29. The means used there for restoring lambs benumbed with cold, 89.

Ewe, what should be her shape? 33. Of what age should ewes be when establishing a flock? 35. How many should be put to one ram? 67. At what age is it proper to put them to breeding? The precaution in coupling, and the care to be taken after, 65, 66. How long do they go, before yeaning? 79. How is it known when they are near their time? *id.* Comforting things to be given them while lambing, and what should be done after, 82. How she is engaged to nurse her lambs, *id.* How many does she produce at a birth? 83. What is to be done when she has more than one lamb? *id.* What happens from too long nursing? 84, 85. What should be done that a ewe should nurse and take care of her lamb? 82.

Expense, what is necessary for the melioration of a breed of sheep, and the means of avoiding it? 77.

Exposures, what the best for a home fold, 25.

F

Full of the wool, does it take place with fine woolled sheep? 104.

Fallows, what they are, 11. Sheep may be pastured on them without dogs, *id.*

Fattening of lambs, 88, 89. Of sheep, there are three methods, 98, 99, 100.

Fecundity of a ram, 67. That of ewes sometimes hurtful, 83. It should not be excited in a flock of fine woolled sheep.

Feeding, fields sown, how a shepherd prevents his flock from damaging, 45.

Fenugreek, or Lupins, given to sheep, 51, 52.

Filaments of wool, their variation in point of coarseness, 30.

Fire, or Smoke, necessary to keep off wolves, 17, 18.

Fleece, what is proper to do with it, 104, 108, 109, 111.

Flies, what sheep do to screen themselves from them, 39.

Flock, at what age is it proper to form it? 34.

Fodder, on what months it should be given, 57. At what time of day, *id.* When to desist from giving it, 60. The best makes sheep lose their flesh, 47, 48: means to prevent it, *id.* When necessary to give it, *id.*

- Fog*, makes sheep loathe their food, 63.
- Fold*, what it is, 116. What should be its size, 117. Manner of making and erecting hurdles, 116. How the fold is made, 119. How and when placed by the side of another, 120.
- Fold, domestic, home fold, or sheep cot*, what it is, and its size, 25. Situation, *id*. Height of the enclosure, *id*.
- Folding*, what it is, and how done, 116. How long a time ought sheep to remain in a fold? 118. Should it continue through the night? 121. At what hours of the night or morning should it be changed? 121. If sheep can be folded in winter, 122. What required to manure an acre of land by folding, 118. What is the smallest number of sheep which can be folded? 118. Manner of cultivating land for folding, 124. How long does the manure from folding last? *id*. What is half-folding? 125. Is folding good for pastures? 126. On what artificial pastures has folding been tried? 127. What is blank folding? 121, 122.
- Food of lambs*, how can lambs be fed which have no dams? 76. At what age can lambs take other food than milk? 90.
- Food*, for shepherds' dogs, 16.
- Food of sheep*, what is best? 46, 47. What green food can be had for them in winter? 48. At what time should food be given them? 57. When snow prevents the flock from going out, what food should be given it? 57, 58. How much food is given to sheep at once? 58, 59. What are the advantages of fresh food? 58. When fed at the rack, what should be first given them? 59.
- Frost, white*, injurious when eaten by sheep: what is its remedy? 63.
- Fright*, will make ewes miscarry, 78.

G

- Garlic*, to be given to ewes and rams when they want ardour, 78.
- Gorbes*, or balls of wool, what they are, and how they destroy lambs, 88.
- Gouts*, may be used for nursing lambs, 86.
- Grains*, what are the kinds given to sheep in winter? 50.
- Grasses*, their distinction and character, 54, 55. Their use in artificial pastures, 54.
- Grease*, in winter, preferable to tallow when used in an ointment for the scab, 108.

H

- Ham*, its strength serves to shew good or bad health, 36.
- Hay*, what the best and worst kinds, 53. What quantity should be given at a feeding? 59, 60. The finest, good food for lambs, 99.
- Harricot beans*, given to sheep, 51. The straw or chaff made into bundles for the same purpose, 52.
- Hazle tree*, its branches good for making hurdles, 117.

- Health of sheep*, signs of bad, 33 Of good, 35.
Heat, more dangerous for sheep than extreme cold, 28. The dangerous practice of sheep to avoid the heat of the sun, 39. A disease, and bleeding its remedy, 39
Height of sheep, how measured, 29. What preferred, 34. What should be done to increase it, 68.
Hemp-seed, given to sheep in winter; its effects, 50. Cakes made of it, and their bad effect, 51.
Herbage, what is best for the fattening of sheep? 90. Of trees, good, 100.
Horns, sheep without them preferred, 66, 67.
Horse-Chestnuts, sheep may be fed with them, 56.
Hoove, a disease of sheep; plants which occasion it, 55, 99.
Hunger, most of the lambs which die are destroyed by it, 87, 88.
Hurdles, the manner of making them, 116. Of erecting them, 117.

I

- Inclosure*, the height a fold should have, 25.
Insects, which spoil sheep's wool, 112. The method of guarding in some measure against them, 114, 115.
Instruments of Musick, proper for a shepherd, 46. Sheep pleased with musick, *id.*
Instruments, surgical, description, 10.
Ivy, ground, increases milk in ewes, 84.

J

- Jarre*, what it is, 32.
Journeying of sheep, at what age and season is it proper? 76. How managed when journeying, *id.*

K

- Kennel*, its description and use, 122, 123.
Knife, a shepherd's, its form, 10.

L

- Lamb*, what should be its situation in the belly of the mother? 80. What are the bad situations and the means of remedying them? 81. What is to be done to make a ewe nurse its lamb? 82. How many lambs may a ewe cast at a birth? 83. What is to be done with a lamb just dropt? 85. When the ewe has not sufficient milk? 83, 86. How can the milk of a ewe be increased? 84. What are the means of making a ewe own a lamb not her own? 86. How a lamb may be fed by hand, 86, 87. What a shepherd should do when a lamb is dull, feeble, and thin, 87. Proof that most lambs die of hunger, 87, 88. Method of restoring lambs benumbed with cold, 88, 89. What is to be done with those, which come late, 89. How to fa:

- lambs, *id.* At what age lambs take other food than milk, 90. At what age good to eat, 91. What precautions do they require before weaning? *id.* At what time should they be weaned? *id.* It is proper to cut off their tails, 92. How done, 93. If it is proper to shear lambs, 107. Experiments on this subject, 107, 108.
- Lancet*, necessary for a shepherd, 10.
- Leaves*, what are the best for sheep? 52, 53. The manner of collecting and preserving them, 53.
- Lentils*, given to sheep, 51, 52, 56.
- Linseed cakes*, food for sheep, 51.
- Linseed straw*, may be given, but it is the worst kind, 57.
- Litter*, should the sheep yard be always covered with it? 27. Given to lambs when fattening, 89.
- Locks of wool*, what are their different lengths? 50.
- Lodging*, for sheep, what kind is to be preferred? 18, &c.
- Looseness*, or *scouring*, how cured, 63.
- Lucern*, may in some cases be injurious to sheep, 42. Cultivated as an artificial grass, 54. What are its properties? 55. Good for fattening sheep, *id.*
- Lupines*, or *Fenugrec*, given to sheep, 51. How prepared, 52.

M

- Manuring*, or *dressing of land*, by folding, 124.
- Marsh*, rushes growing thereon make bad hay for sheep, 53.
- Mastiffs*, a good breed of dogs to defend sheep against wolves, 16.
- Maturity of sheep's wool*, how known, 103.
- Meadow*, the hay of salt meadow best for sheep, 53. That of dry pastures very good, 53. Of low marshy ground the worst, *id.*
- Means*, of knowing the ages of sheep, 28. Of preventing the bad effects of dry food, 46. Of restoring lambs benumbed with cold, 88. Of knowing good milk, 86.
- Melting of the fat*, or *molten grease*, a disease of sheep, 56.
- Migration of sheep*, means of destroying the scab, 56.
- Milk*, how it is known if a ewe's be good, 86. How to be increased in ewes, 83, 84. At what times ewes can be milked, 84. What ewes can be milked with advantage, 85.
- Miscarriages*, in ewes, to what causes attributed, 11, 77, 78, 79.
- Moisture*, moist, wet soils injurious to sheep, 38.
- Moths*, not worms, and in what they differ; their description; the damage they do; their transformation, injury and means of guarding it, 112, 113, 114, 115, 116.
- Musick*, sheep pleased with it; the instruments proper for a shepherd, 46.
- Mustard*, although good for sheep may prove injurious to them, 42.
- Muzzle*, to prevent lambs from sucking, 92.

N

- Navel string*, when the shepherd should break it, 81.
Nut, or *walnut cakes*, given to sheep, 51.

O

- Oak nuts or acorns*, serve for feeding sheep, 50, 51. Also, its leaves and branches, 52, 53.
Oats, excellent for sheep in winter, 56. Prevent sheep losing their flesh in winter, 59. Good to increase milk in ewes, 83, 84. Good for lambs when ground, 90. The best grain for stall feeding lambs.
Oat-chaff, good for sheep, 52.
Oat straw, the best of any other, 56.
Oil cakes, made from turnips, hemp-seed, &c. are good for sheep, 100.
Oil of turpentine, its use in curing the scab, 103, 131.
Ointment, for the scab, shepherds should always have it, 10. The manner of making it, 108. Proper for sheep after shearing, 108. Best for the scab, 131. The manner of using it, and the circumstances when it is necessary, 132.
Onions, should be given to ewes and rams not sufficiently ardent, 78.

P

- Parnips*, preferable to cabbages for feeding sheep, 42. Increase milk in ewes, 84.
Pasturing, rules to be followed concerning it, 36. On what depends the goodness, 47. Can it be had in winter after frost? *id.* How can the want of grass be supplied? 47, 48, &c. A change of it good for nursing ewes, 84. Wet pastures good to fatten sheep intended to be killed, 99, 100. Method of obtaining the greatest profit from pasturing in the fattening of sheep, 97, 98.
Peas, may be given to sheep, 51. Should be made into bundles, and the straw and leaves given to them, 52. Boiled, increase milk in ewes, 80. Blue, very good for feeding lambs, 90. Their use in stall-feeding, 101. Pods of peas, beans, &c. may be given them, 53, 56.
Pine trees, sheep will eat the bark, 53.
Poplar, its leaves good for sheep, 56. The bark also given them, *id.*
Plants, do sheep eat such as are hurtful to them? 42. What are the plants, which, although nutritious, may prove hurtful to sheep, *id.* How this disease is prevented, 43, 44.
Popsy, may do injury to sheep, 42.
Potatoes, may be given sheep in winter, 49.
Precautions, to be taken against wolves, 17. In coupling of ewes, 93. Before and after castration, 94. After shearing, 108.
Preservatives, pretended against moths, 114, 115, 116.
Proportions of body, for a good ram, and for a good ewe, 33.

Provender, to be given, when a ewe refuses the ram, 78. When the ram wants ardour, *id.* And when a ewe is unable to cast her lamb through weakness, 79.

Q

Qualities (different) of wool, in the same fleece, 111.

Quantity, of food to be given to sheep at a feeding, 61—64. Of cabbage leaves, 58. Of straw, 59. Of hay, 60. Of grass, 61. Of drink, *id.* Of salt, 63, 64. Of food at stall-feeding, 100.

R

Ram, what are the proportions of body which should distinguish him? 33. At what time should he be put to the ewes? 65. Are those which have no horns to be preferred? 66, 67. At what age should he be put with the flock, and to what time can he produce good lambs? 34, 35. How many ewes can he serve in a season? 67. Good rams more necessary than good ewes to improve a flock, 73. The choice to be made of rams to improve a breed, 74. The method of leaving them with the flock for the whole year improper, 77.

Races, or *breeds*, (different) of sheep, 29. Are the largest best? 34.

Rack, for sheep, its description, 21. Situation in the home fold, 23. To be placed very low, 28. Means to prevent the want of it, when sheep are on a journey, 76, 77.

Radishes, given to sheep in winter, 49. Good for milk, 84.

Rain, less injurious to sheep than dew, 38. Cold rains to be feared after shearing, 108.

Ray-grass, or *melilot*, lambs fed on it when weaned, 91. Used for artificial pastures, 54. Its qualities, 55.

Reeds, the worst kind of hay for sheep, 53.

Renewal and *fall* of sheep's wool, 104.

Roots, what kinds can be given to sheep in winter? 49.

Rot or *scab*, a disease in sheep; wet may produce it, 38, 41. Too much drink one of the causes of it, 58. Fat sheep liable to it, 102. Migration may cure it, 36.

Rules, to be observed in driving a flock, 44, &c.

Rumination or *chewing the cud*, 46. How is it known when a sheep is so doing? 41.

Rye, green field rye may sometimes prove injurious to sheep, 42.

S

Saintfoin, artificial meadow made with it, 54. Its qualities, 35. It may be given to lambs, 90. Is the best grass for fattening sheep, 99.

Salists, or *goats beard*, proper for sheep, 49. Makes ewes increase their milk, 84.

- Salt*, is it proper to give to sheep, 64. The effect it produces, *id.* In what quantity, at what time, and in what manner to be given, *id.* Put on the back of lambs, in some cases, to make the ewes lick them, 82.
- Samples*, necessary to know the different qualities of wool, 31.
- Satchel*, or *scrip*, necessary for a shepherd, and its use, 10.
- Scouring of sheep*, a disease; dew and white frost produce it, 63, 99. Means of preventing it in lambs, 89. Pernicious in fattening, 99.
- Scouring of wool*, how it is done, 110.
- Scab*, a disease in sheep, its symptoms, 130, 131. There is a scab, which does not itch, 131. What is the best application for it? *id.* How is it used? 132.
- Scratcher*, its form, 10.
- Season*, when fodder is given, and when discontinued, 57, 60.
- Seeds*, what are those used for sheep in winter, 59.
- Sheds*, what they are, and if they make good lodging for sheep, 19, 20.
- Sheep*, in England, remain the whole winter in the open field, 23. What are the principal points which distinguish them? 28. How is their age known? *id.* Their different sizes, 29. Different breeds, *id.* Means of enlarging them, 68. Different qualities of their wool, 31. Signs of their ill health, 33. Description and cure of their common diseases, 127—133. How to choose sheep to have them good, 33. Are the largest to be preferred? 54. At what age to form a flock, *id.* The attention to be paid in shifting sheep from one country to another, 56. Rules to be observed in pasturing them, *id.* In coupling them, 65. Means of drawing good profit from them, *id.* At what age and season to journey, 76. Precautions to be taken in bringing them to a new country, 77. At what time to shear, 103. How to be washed before shearing, 105. The care to be taken of them after shearing, 108, 109. Folding, 116. How much land each sheep can manure at a folding, 123. On chewing the cud, 40. Sheep of Spain produce lambs at a great age, 68.
- Sheep fescue grass*, (coquiote) 54. Its qualities, 55. Can be used for the fattening of wethers, 100.
- Shepherd*, at what age to be chosen, 7. His livelihood, 7, 8. His qualifications, 8. His necessaries, 8, 9. How he ought to conduct his flock, 36. German shepherds wean their lambs at six weeks, 84.
- Shelter*, what is the best, 29.
- Skirret*, its root good for sheep in winter, 49.
- Snow*, prevents the gangrene in parts frost bitten, 9. How do sheep get rid of it? 22. Can they be buried in it for a length of time without suffering, 22, 23, 24. Is it hurtful to sheep to eat it? 63. Experiments thereon, *id.*
- Second wool*, its fineness, the part of the body from which it is taken, 111.

- Signs*, by which good sheep are known, 33. When fat, 102. When in bad health, 33. When in good, 55. When a ewe is about to cast her lamb, 79.
- Situation* of the lamb in the belly of the mother, 80, 81. What are bad situations, and the manner of changing them? 81.
- Shearing*, at what time it should be done, 103. The best method, 106. If proper to shear lambs, 107. Treatment of sheep after shearing, 108.
- Soil*, what most proper for sheep, 97.
- Sorting of wool*, the Spaniards sort the fleece into four parts, 111.
- Spirits of Turpentine*, is its smell a preservative against moths? 115.
- Stable*, when a close one is the worst lodging for sheep, 18. When open, what its good and bad effects, 19.
- Straw*, threshed, given to sheep, 56. What are the best kinds, *id.* What quantity should be given at a feeding? 59. To what time is this food sufficient? 60. If twice threshed it may be given to lambs, 90. Oat straw is the best for lambs, *id.* Barley straw sometimes sticks to the tongue and always to the wool.
- Suckling*, what is proper to be done to make a ewe nurse its lamb, 82. 83. Nursing too long injurious, 84.
- Sulphur*, its smoke destroys moths, 113. It should not be used in store-houses of wool, *id.*
- Sun*, how sheep defend themselves against its ardour, 39. Its great heat injurious after shearing, 108.

T

- Tail*, is it proper to cut off the tail of lambs? 92. The inconvenience of leaving it its whole length, *id.* How it should be cut, 93.
- Tallow*, used in an ointment for the scab, and is preferable to grease in summer.
- Teeth*, their different renewals, forms, decay, and fall, indices of the age of sheep, 28.
- Third quality of wool*, how designated, 111.
- Thirst*, too great, a sign of diseased sheep, 61, 62.
- Thunder*, produces miscarriage, 78.
- Times*, for coupling, 65. For giving sheep fodder, 57. For discontinuing it, 60. For giving them drink, 61, 62. For giving them salt, 63, 64. For driving them to pasture, 39, 40.
- Timothy or herd's grass*, used for fattening sheep, 100.
- Tippler*, a small tube for the feeding of lambs, 86, 87.
- Topinambours*, a species of potatoes used for feeding sheep in winter, 49.
- Trefoil*, artificial pastures made of it, 54. Its qualities, 55. May be given to lambs, 90. Serves for fattening sheep, 100. May give them the hove, 42. Good for weaning lambs, 90.

- Trees*, sheep can be made to eat the bark and leaves, 56.
Troughs, how made and placed, 26, 27.
Turnips, a pretty good food for sheep, 49. Favourable to milk in ewes, 84. Serve for stall feeding, and how used, 101. Oil cakes made with the seed, given to sheep, 100.
Twisting the bag or cord of rams, what it is, 96.
Twitchgrass, (*fromental*;) is ranked among the artificial grass; its qualities, 54. And serves for the fattening of sheep, 100.

U

- Urine*, necessary for the scouring of wool, 110.

V

- Vegetables*, what are those given to sheep? 51, 52.
Vein, the angular, the most convenient for bleeding, 128.
Veins, shew the good or bad health of sheep, 35, 36.
Vertigo, in sheep, 38.
Fetches, given to sheep, 51. What is done with the straw after threshing? 52, 56.

W

- Washing of wool on the sheep's back*, how done, 105. Precautions necessary, *id.* After shearing, 109. At what time and in what manner done, 109, 110.
Water, what good and bad for sheep, 61. What quantity should a sheep drink, and at what time should it be given? 61, 62.
Weaning of lambs, when and how should it be done? 90, 91, 92.
Wethers, why made, 93, 94, &c. What are the signs of good? 33. At what age put with the flock, 35. What soil best agrees with them, 97. When fat in the flock, 98. Different methods of fattening them, *id.* What are the signs of being fat? 102. Do they live long? *id.* At what age is it proper to fat them? 102, 103.
Wethers, female, why so called, and at what age made, 95. How done, 97.
Wheat, when green, may be injurious to sheep, 42. Bundles of threshed straw very good for sheep, 52. Its straw not so good as rye straw, 56. Wheat bran good in winter, 50. Mixed with oatmeal, good for lambs, 90. Good for stall feeding, 101.
Whip, necessary for a shepherd, 9, 44.
Wind, when at north-east, should be sheltered within the home fold, 25.
Willow tree, the sheep eat its leaves, 53.
Winter, sheep may be abroad in the open air, 22. Experiments to prove the fact, 23, 24.
Wood, stands the frost and winter; pasture may be made of it, 47.

Wool, secures sheep against injury from the air, 22. How it is distinguished, 30, 31. Mother wool, what it is, 111.

Wolves, what precautions should be taken against them, 18. What the shepherds should do when one approaches his flock, *id.* Provoke miscarriages by frightening the ewes, 78.

Worms, in wool, are no other than moths. See *Moths*.

Y

Yoke elm, sheep eat its leaves, 53.

Folk, or the *grease in wool*, what it is, 22. Its use, 23, 109